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PHILADELPHIA MEETING, A. M. U.

MARINE BIOLOGICAL LABORATORY WOODS HOLE LIBRARY MASS.

THE NAUTILUS.

Vol. XLV JULY, 1931. No. 1

THE AMERICAN MALACOLOGICAL UNION

While the organization of a society for those interested in the collection and study of mollusks had been talked about for some time, the first definite steps toward that end were taken by Mr. Norman W. Lermond, who carried on an extensive correspondence with conchologists all over the country during the past winter. His overtures were nearly everywhere received favorably, 192 persons signifying the desire to join the proposed society. A list of these was printed and circulated by Mr. Lermond in March, and a meeting was called to be held at the Academy of Natural Sciences of Philadelphia, April 30th and May 1st and 2nd.

Twenty-nine persons from twelve states as far apart as Maine, California and Alabama, participated.

The first session, held at 2.00 p. m., April 30th, was welcomed by Mr. C. M. B. Cadwalader, Director of the Academy of Natural Sciences. Dr. Pilsbry was made chairman and Mr. Lermond secretary *pro tem.*

After adoption of the constitution (page 3), the following officers for the year were elected:

President: Henry A. Pilsbry.

Vice-President: Paul Bartsch.

Secretaries: N. W. Lermond, Imogene C. Robertson (Mrs. Harold R. Robertson).

Group of members attending the Philadelphia meeting of the A. M. U., 1931. Unfortunately only twenty of the twenty-nine members attending were present when this photograph was taken. 1, H. R. Robertson. 2, F. Tobleman. 3, Mrs. I. S. Oldroyd. 4, Calvin Goodrich. 5, Imogene C. Robertson. 6, Allan F. Archer. 7, D. T. Jones. 8, J. E. Andrews. 9, H. A. Pilsbry. 10, W. F. Webb. 11, J. W. Jones. 12, W. J. Clench. 13, Junius Henderson. 14, Paul Bartsch. 15, H. A. Rehder. 16, W. B. Marshall. 17, H. G. Richards. 18, T. H. Aldrich. 19, E. S. Marks. 20, N. W. Lermond.

Treasurer: Charles W. Johnson.[1] [Imogene C. Robertson, Buffalo Museum of Science, Buffalo, N. Y.]

Council (additional to officers): Junius Henderson, Wm. J. Clench, Calvin Goodrich, Mrs. Oldroyd.

Mr. Lermond gave an account of his activities in the preliminary organization. A vote of thanks for this labor of love was passed, and it was voted to reimburse him for expenses of printing.

The following papers were read:

Ruganodontites, a New Subgenus of South American Freshwater Pearly Mussels, by Wm. B. Marshall. Printed in this number.

Molluscan Faunas of the Rocky Mountain and Pacific Coast Regions, by Junius Henderson.

Notes on Animals, by H. B. Baker.

Discussion of these papers followed by Dr. Bartsch, the chairman, and others. Mr. Tobleman spoke on the use of wood alcohol as a preservative. Greetings were read from several absent members: Bryant Walker, Fred Baker, Frank C. Baker, C. T. Simpson, Dr. V. Sterki, B. H. Wright, Dr. Carlos de la Torre.

In the evening Dr. Pilsbry talked on the Pinchot South Sea Expedition, with film illustration.

Friday, May 1. Dr. Pilsbry in the chair.

The Microscope in Conchology, by Fred Tobleman, dealt chiefly with the preparation of molluscan radulae.

Shells that have Strayed far from Home, by Mrs. Oldroyd.

Mollusks as Climate Indicators in the Pleistocene, by H. G. Richards (lantern slides).

Chinese Land Mollusks, by Allan F. Archer. Specimens exhibited.

Preservation of Fragile Shells, by Wm. J. Clench.

These papers were discussed by Dr. Bartsch, Dr. Baker, Dr. Pilsbry and others.

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[1] Mr. Johnson finding it impossible to serve, the Council appointed Mrs. Robertson Financial Secretary for the year.

In the afternoon session the following were given:

Liguus of Florida and "ligging" in the Everglades, by Wm. J. Clench. Exhibition of specimens. Printed in this number.

Shell Formation in Land and Freshwater Mollusks, by Prof. David T. Jones.

The meeting was then entertained by reminiscences of past and present workers in American Conchology, by Truman H. Aldrich, and recollections of Tryon, Dall and others active years ago, by Mr. Marshall.

By unanimous vote it was resolved that the Union go on record as favoring the plan now pending in Congress to make the southern Everglades a National Park.

The question of affiliation of the Union with the A. A. A. S. was referred to the Council.

All who had joined the preliminary organization are considered members of the Union.

The President was directed to appoint a committee of three on nomenclature, himself to be chairman.

After remarks by the Rev. Walter H. Smith on various aspects of the Union's activities the meeting adjourned.

The annual dinner was attended by 20 members, after which Dr. Bartsch gave an interesting account of his field investigations in the West Indies, with lantern illustrations.

It had been arranged to make Saturday, May 2nd, a field day. Owing to rain this plan could not be carried out, but a considerable number of members seemed to find informal talk in the mollusk department of the Academy by no means the least enjoyable part of the meeting.

At a meeting of the Council held on May 2nd the confirmation of the regional vice-presidents elected by the preliminary organization was confirmed. The question of local Chapters was left to local clubs, such as now exist in Boston, Buffalo and elsewhere.

Constitution of the American Malacological Union

1. This society shall be called "The American Malacological Union.

2. Its object shall be the promotion of the science of malacology by holding meetings for reading and discussion of papers, and for furthering the interests of students and collectors of shells by facilitating acquaintance and co-operation among the members.

3. Membership shall be limited to persons resident in the Americas and Hawaii. New members may be proposed by two members and balloted for by the Council. They shall pay an annual subscription of $1.00.[1] They will receive without other charge all notices, programs, lists of members, etc., issued by the Union.

4. The following officers shall be elected annually by ballot: President, Vice-President, two Secretaries, Treasurer.

5. The Union will be governed by a council consisting of the officers and four other members to be elected annually by ballot.

6. The annual meeting shall be held at such time and place as may be fixed by the preceding annual meeting. Other meetings may be called by the Council. Meetings of local branches may be held as such branches may determine.

7. Proposals for the alteration of this constitution when signed by five members and passed by the Council shall be acted upon at the next annual meeting. Concurrence of three-fourths of the ballots cast are necessary for any alteration.

8. THE NAUTILUS is hereby designated as the official organ of the Union.

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[1] Dues were originally fixed at $3.00 a year to include a subscription to the NAUTILUS which is $2.00 for four quarterly numbers. On account of postal regulations governing third class matter, subscriptions to NAUTILUS cannot be included in the Union dues, and this article will have to be changed. *Actual dues to the Union are thus $1.00 a year* payable to the Financial Secretary, to whom subscriptions to the NAUTILUS may also be sent for transmission to Mr. Johnson, or subscriptions may be sent to Mr. Johnson direct, as formerly.

While members are not required to take the NAUTILUS they are advised to do so since abstracts of papers presented at the meetings and other information relating to the activities of the association will be available through that medium. By remitting dues promptly the members will enable our new organization to function efficiently for the benefit of all.

List of Members in Attendance

T. H. Aldrich, 1026 Glenn Iris Ave., Birmingham, Ala.
John E. Andrews, 50 Orton Place, Buffalo, N. Y.
Allan F. Archer, Harvard University, Cambridge, Mass.
Horace B. Baker, University of Pennsylvania, Philadelphia, Penn.
Paul Bartsch, National Museum, Washington, D. C.
Stanley T. Brooks, Carnegie Museum, Pittsburgh, Penn.
William J. Clench, Museum of Comparative Zoology, Cambridge, Mass.
Calvin Goodrich, Ann Arbor, Mich.
David T. Jones, Marietta, Ohio.
J. W. Jones, 818 E. 5th St., Vinton, Iowa.
Anne Harbison, Philadelphia, Penn.
Junius Henderson, University of Colorado, Boulder, Colo.
Norman W. Lermond, Thomaston, Maine.
Herbert N. Lowe, 2209 Lowena Drive, Long Beach, Calif.
E. Sydney Marks, Arlington, N. J.
William B. Marshall, United States National Museum, Washington, D. C.
North McLean, Shrub Oak, N. Y.
Mrs. North McLean, Shrub Oak, N. Y.
Ida S. Oldroyd, Stanford University, California.
H. A. Pilsbry, Philadelphia, Penn.
Harold A. Rehder, Harvard University, Cambridge, Mass.
Horace G. Richards, University of Pennsylvania, Philadelphia, Penn.
Harold R. Robertson, 136 Buffum St., Buffalo, N. Y.
Imogene C. Robertson, Buffalo Museum of Science, Buffalo, N. Y.
Walter H. Smith, Utica, N. Y.
Fred Tobleman, 114 McWhorter St., Newark, N. J.
E. G. Vanatta, Philadelphia, Penn.
Walter F. Webb, Rochester, N. Y.
F. T. Webber, 27 Sycamore St., Holyoke, Mass.

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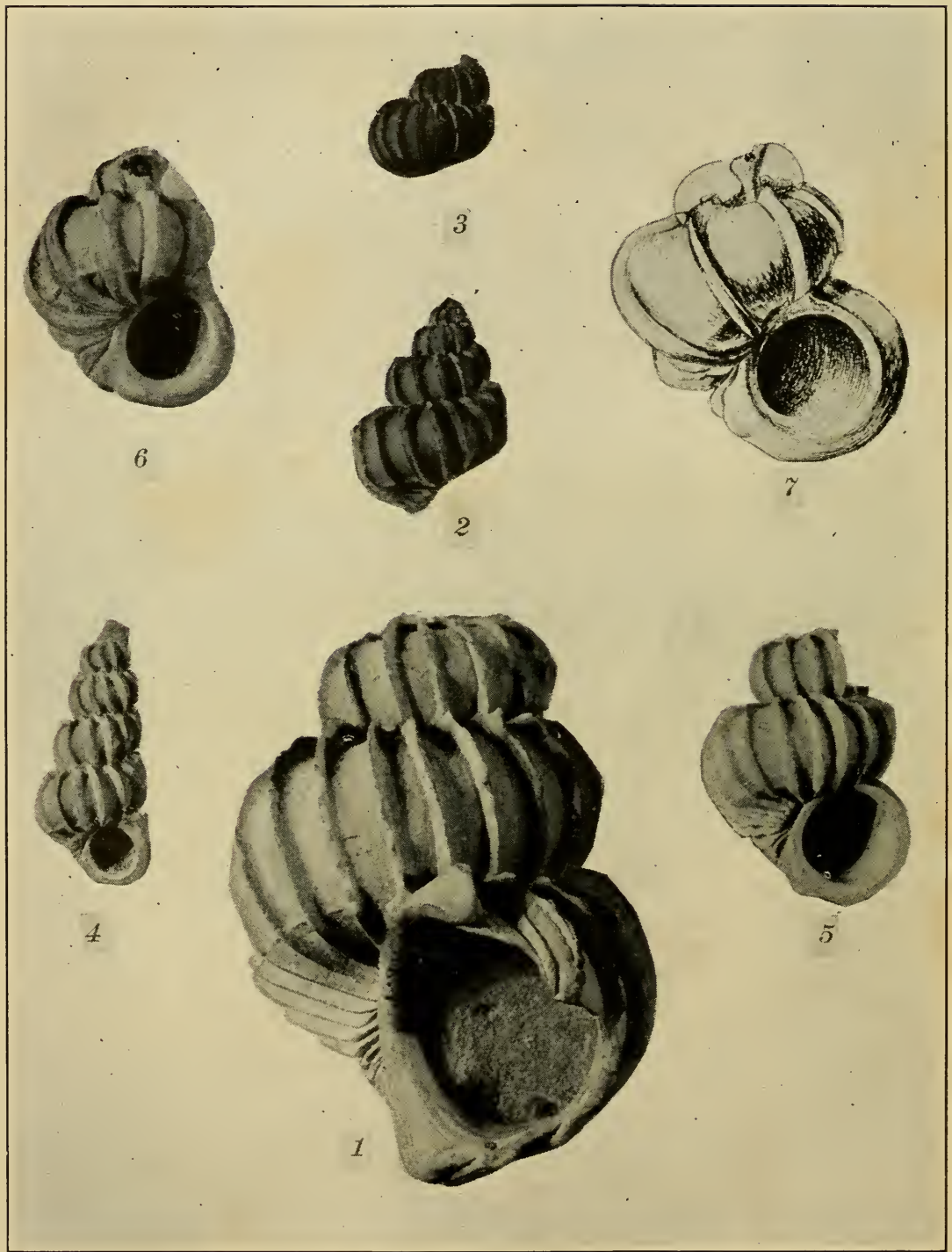
NEW FOSSIL SPECIES OF THE GENUS EPITONIUM FROM SOUTH CAROLINA

BY CHARLES W. JOHNSON

While visiting Charleston, S. C., during the latter part of March and early April, I spent some time in going over the collection of shells in the Charleston Museum. Among the species of special interest was an unusually large fossil Epitonium, the size of which was surprising, for I had not heretofore seen a species larger than the recent "precious wentletrap" (*Epitonium pretiosum* L.). The largest specimen represents about two and a half whorls, the more apical whorls missing. That it represented a new species was quite evident unless perchance that a species had been previously based on a young specimen. On my way north I stopped in Washington and through the kindness of the officials in the National Museum, found two specimens of this species undescribed, one of which practically represented four of the spiral whorls of this large species. The two specimens will therefore be considered cotypes and described as though one.

EPITONIUM CHAMBERLAINI sp. nov. Pl. 1, figs. 1, 2.

Whorls very convex, suture deep, body whorl with nineteen large narrow, lamelliform costae, which are slightly reflexed at suture, penultimate whorl with seventeen costae. The apical section has thirteen costae on the lower whorl, ten on the upper and eleven on each of the two intermediate whorls. On the lower part of the body whorl at the sutural line is a raised spiral ridge between the costae becoming obsolete toward the apex. Lip expanded at the base of the columella. The exact length of the shell can only be estimated. The large basal section is 65 mm. and the apical section 25 mm. in length. That there is part of a whorl missing between the two sections is quite evident as the distance between the sutures in the upper whorl of the larger part is about 11 mm. and in the lower whorl of the smaller section 9 mm. Making allowance for the broken costae at the base of the large sec-



1 and 2. Epitonium chamberlaini sp. n. 3. E. raveneli sp. n. 4. E. charlestonensis sp. n. 5. E. cooperensis sp. n. 6. E. subexpansum sp. n. 7. E. mazyckii Dall.

tion and the apex which probably consisted of another whorl in addition to the protoconch, it is safe to say, that this large species when living was about 100 mm. in length.

The larger of the cotypes representing the basal part, figure 1 (No. 30,112.1 Charleston Mus.) was collected by Mr. E. Burnham Chamberlain of The Charleston Museum, May 31, 1930, near Charleston, S. C., about a mile and a half above the Etiwan Fertilizer works on the Cooper River, on a small island, thrown up by dredging about ten years ago. The apical portion representing the other cotype (fig. 2) is in the U. S. National Museum, labeled "Navy Yard, Charleston, Sloan 444," Station No. 5531, was placed in the Eocene. A second specimen from the same locality, Station No. 4832, consists of a small fragment of half of two whorls. A third specimen, Station No. 4559, from Marl pit at Ingleside Station on railroad from Charleston to Summerville, nine miles from Charleston, S. C., Earl Sloan, coll. 1907 (Oligocene?). This specimen is 24 mm. in length, 20 mm. in diameter with 16 costae to a whorl.

The following three imperfect specimens from the Eocene, Ashley River (Dr. Gibbes) are in the Edmund Ravenel collection, Charleston Museum No. 1118. One shows two whorls with a part of the shell, poorly preserved, covering the internal cast. Length about 52 mm., diameter 38 mm. A second specimen consists of one whorl and a half, about 36 mm. in length and 29 mm. in diameter, with fourteen costae to a whorl. Of the third specimen there is only a fragment of a whorl showing five costae, length 20 mm.

On May 9, 1931, Mr. Chamberlain found 18 fragments of this species at the same locality where he had found the large specimen.

EPITONIUM RAVENELI sp. nov. Pl. 1, fig. 3.

This resembles somewhat the young of the preceding species, but the costae are round on the edge not narrow and lamelliform, with only a slight reflection near the suture. The body whorl has sixteen and the penultimate whorl four-

teen costae; on the lower part of the body whorl at the sutural line is a raised spiral ridge between the costae; fine spiral striae are present between the costae over the entire shell; aperture round, lip expanded at the base of the columella, shell light brown. Length of the two whorls 15 mm.

It is said to be Eocene and is described from a specimen in the Edmund Ravenel collection, No. [1130] in The Charleston Museum. Collected at St. Johns, B[erkeley], S. C.

EPITONIUM CHARLESTONENSIS sp. nov. Pl. 1, fig. 4.

Shell elongate, moderately slender, whorls convex the costae prominent, angulate and slightly reflexed below the suture, body whorl with twelve the others with twelve and thirteen costae, the spiral ridge between the costae at the sutural line prominent and between the costae fine spiral raised lines. The type which consists of four and part of a fifth whorl measures 30 mm. Type in the Charleston Museum.

The type and two similar specimens were collected by Mr. Chamberlain, May 9, 1931, on the same small island from which the large cotype of *E. chamberlaini* was taken. One of the specimens shows slightly more prominent spiral lines than the type.

EPITONIUM (ASPEROSCALA) COOPERENSIS sp. nov. Pl. 1, fig. 5.

Whorls very convex; body and penultimate whorls each with fifteen thin lamelliform costae; the usual raised ridge at the sutural line obsolete, above this line the prominent raised spiral lines alternate large and small, sometimes showing still smaller lines between these; below the sutural line the raised lines between the costae are even and regular in size; six of the costae do not reach the columellar lip (probably abnormal). Length of the two whorls 31 mm.

One specimen collected by Mr. Chamberlain, May 9, 1931, on the same small island on the Cooper River from which the large cotype of *E. chamberlaini* was taken. Type in the Charleston Museum.

EPITONIUM (STHENORHYTIS) SUBEXPANSUM sp. nov. Pl. 1, fig. 6.

Shell short, turbinate, whorls convex, body whorl with nine large, broad costae, the older costae becoming much thickened, a prominent raised spiral ridge between the costae at the sutural line and conspicuous spiral striae between all the costae. In the type the two costae preceding the lip are deformed, one being unusually thick, the other very narrow. Length of the two whorls 29 mm. Type in the Charleston Museum.

Since my visit to Charleston, Mr. Chamberlain again visited the locality where he found the large specimen of *E. chamberlaini* and among some 23 more or less broken specimens, was this interesting species. The shell resembles in form *E. expansum* Conrad of the Miocene, St. Mary's Formation, but lacks the prominent expansion of each rib into a broad angle just below the suture.

EPITONIUM (STHENORHYTIS) MAZYCKII Dall. Pl. 1, fig. 7.

Scala (*Sthenorhytis*) *mazyckii* Dall. NAUTILUS, vol. 9, p. 111, 1896. Figured in Trans. Wagner Free Inst. Science, vol. 3, pt. 5, pl. 41, figs. 1 and 2, 1900. Diam. 28 mm.

Miocene, Cainhoy, South Carolina (W. G. Mazyck). I had the pleasure of seeing the type of this interesting species through the kindness of Mr. Mazyck. Two very pleasant evenings were spent examining his fine collection.

I am indebted to Miss Laura M. Bragg, Director, and Mr. Wm. G. Mazyck, Honorary Curator of Conchology, of the Charleston Museum for the privilege of describing and figuring these interesting shells; to Mr. E. Burnham Chamberlain for again visiting the type locality of *Epitonium chamberlaini* and collecting additional material and to Miss Emma B. Richardson for her kind assistance. I am also under great obligation to Dr. Paul Bartsch of the U. S. National Museum for the loan of a specimen representing the more apical portion of *E. chamberlaini*.

As some question arose as to the age of the fossils found

on the Cooper River, I cleaned out some of the material still in the shells and submitted it to Dr. Joseph A. Cushman who found about 35 species of Foraminifera characteristic of the Eocene, Cooper Marl, thus definitely determining the age of this formation.

"LIGGING" IN THE EVERGLADES OF FLORIDA

WILLIAM J. CLENCH
Museum of Comparative Zoology

With very few exceptions, the collector of arboreal mollusks has more thrills crowded into one hour of good hunting than a general collecting trip will yield him in a week. To locate a hammock containing a colony of *Liguus* is to reach a high spot in collecting that has but few equals.

Such was our good fortune during the past winter. I prevailed upon W. E. Schevill, a fossil hunter, to drop his antiquities long enough to enjoy a bit of modern zoology in the land of sunshine and mosquitoes. The Museum truck was at our disposal and equipped with our camping duffle we set out from Cambridge headed for Florida on Feb. 9th, in a delightful New England sleet and snow storm.

Noon of the following day we stopped at the Academy of Natural Sciences in Philadelphia to see Dr. Pilsbry. Since the Pinchot trip, Dr. Pilsbry has scarcely been on speaking terms with me. After all, a seven months' expedition to the South Seas is pretty tony, and my ravings of the Tennessee and Georgia trips I had previously made left him rather cold. Fortune was with us. The day was cloudy and the worst part of winter was still ahead—and that's a lot of grief for anyone living in Philadelphia. We rubbed it in. The joy of collecting in new country, warm weather and old clothes, have more than ordinary appeal for the Chief, and we handed it to him. At the end of an hour's talk we could detect real envy, and considering the books partially balanced we left for Washington and beyond.

Four days of good roads, warmer weather and car trouble saw us entrenched at the home of Dr. Fairchild in Coconut Grove. Here we were able to outfit more completely for our camping trip and enjoy a few days of delightful hospitality on Biscayne Bay before entering the Everglades.

Our original plans had called for a boat trip through the 'glades from Pinecrest south to Long Pine Key. However, the water was too low for such transportation and we decided to go to Long Pine Key, which was but imperfectly known. This is an area a little west of Royal Palm State Park. It is composed of glades alternating with pine ridges or islands. A new road eight miles long has been constructed running west across about half the length of the key, and we were to work the territory along this road. A few tomato growers farming the glades are engaged in a rather precarious livelihood, and from what we saw and learned, the plowing must be done with a motor boat! When we arrived the country was fairly dry, though several hammocks, especially south of the road, had to be reached by wading in water six inches to a foot in depth.

Through the courtesy of Mr. Frank van Marlen, the manager of the park, permission was granted us to camp near the park lodge. From here we could drive out each morning to our collecting grounds leaving our camp set up.

As stated above, only a few hammocks in this region had been investigated. Most of these were near the road and readily accessible by walking up the glades. Our introduction to these hammocks proved them to be far richer than we had hoped and altogether too good to be enjoyed alone, so letters were sent to Dr. Pilsbry and Mr. Goodrich to join the party. Mr. Goodrich found it impossible to come, but Dr. Pilsbry telegraphed that he would be with us as soon as the southbound train could carry him. He never told me what excuse he gave the powers that be in Philadelphia for going to Florida in mid-winter. I find it exceedingly difficult to explain why the best "lig" collecting is to be found during the height of the gay season!! Tsk! Tsk!

By the time Dr. Pilsbry had arrived we had amassed a

sizable fortune in *Liguus,* and during the auto drive from Homestead to camp, vivid stories of collecting were detailed at length.

We had made arrangements for Dr. Pilsbry to sleep at the lodge but to have his meals with us, as our particular type of tent could only accommodate two people. This arrangement worked splendidly for all hands.

Hammocks, as these thickets of broad-leaved trees are called, were found everywhere: in the pine woods, the open glades or on the edge of both the pine land and glades. In general they were quite alike other than in size. The flora of the hammocks is essentially West Indian, with the *Ficus, Lysiloma, Bursera* abundant and with them hosts of other plants unknown to us. The best trees for *Liguus* in this region were the *Lysilomas,* and wherever these trees were found the "ligs" were sure to be found as well. At this season the leaves of the Lysilomas are dark red and this color could be seen for some distance. This aided materially in locating "lig" hammocks, as their colors ordinarily blend with the greens of the pine woods. The story of each day is much the same. Each daily trip had, of course, its own delight in locating different color forms or colonies of *Liguus* that differed in some way from all others that we had seen.

One Sunday Richard Deckert and Henry Frampton of Miami came down and we all started out on our longest single tramp, penetrating the 'glades six miles north of the road. This trip yielded three pure races of *Liguus,* namely *L. fasciatus luteus* Simp., *L. f. castaneozonatus* Pils. and *L. f. cingulatus* Simp., each in a single isolated hammock in the everglade. It is the occurrence of these pure colonies that show the fixity of these color forms as Mendelian segregants.

On two other occasions Paul McGinty and his sons Paul and Tom from Boynton spent the day collecting with us. Maxwell Smith was with the McGintys on their first trip and that day we drove to the end of the road and then tramped due west for nearly two miles to visit two large hammocks. The first contained several large royal palms but the hammock growth in general was so dense that *Liguus* were rather

difficult to find. Charles Mosier made several trips with us and directed us as well to many hammocks that possessed some fine material. Dr. and Mrs. DeBoe of Miami, friends of Dr. Pilsbry and also ardent "lig hunters", drove down for collecting two or three times during our stay. Their trips were made independent of ours but we had the pleasure of comparing notes and exhibiting material that had been collected during the day.

Through a photographer in Miami we had made a series of aerial photographs of our section of the Key. The day the photos were made was a good "flying day" though not so good for photography. Sufficient haze existed to limit materially the height at which pictures could be made and consequently the pictures did not exhibit enough detail to locate many hammocks more than a mile or so from the road. The road had to be included in the pictures to serve as a guide, as this flat country offers but little by way of landmarks. The pictures covered, roughly, a strip about ten miles long, two miles beyond the limit of the eight-mile road. We were able to scale the pictures to distances on the road and readily locate any hammocks that were noted in the photos.

Hammocks could be located blindly by just walking through the pine woods, but this is slow and tiresome work as walking is exceedingly difficult over the rough limestone rock which is pitted with holes and always badly weathered.

Fortunately for us, rattlesnakes were rare in this region. Only four were encountered, three of which we managed to capture, but not alive! It is quite disconcerting to have your eyes focused on a *Liguus* a few feet away and then be suddenly alarmed by the "buzzing" of a rattler. According to popular belief, a rattler always rattles when disturbed, but *Crotalus* No. 3 failed to do so even when being walked over, around and almost upon—if two inches can be called close enough to be considered a disturbance.

Mosquitoes were very rare until the last week and then they became quite abundant, enough so that supper usually consisted in part of setting up exercises. Also a very large Tabanid fly appeared during the last week. It's buzz could

be heard fifty feet away. Visions of the northern "green head" came to mind, and if the bite of these fellows was at all in proportion to their size it must be equal to that of a dog. Fortunately their approach was heralded by so much noise that full preparations could be made to drive them away or else kill them after they landed and before they had managed to find suitable territory to puncture.

It is unfortunate to record that this area as well as others in the Everglade region is being rapidly destroyed. Drainage and fire are fast despoiling a unique territory. Unless steps are soon taken to preserve it, little will remain of the original fauna and flora.

Attempts are now being made to make this section of Florida into a National Park. If this project succeeds a remarkable area will be held for the benefit of future generations, an area that has no parallel for its kind anywhere else in the world. As a wild life preserve, especially for birds, it probably has no equal in the United States, as its interior is so inaccessable, without roads, that natural conditions would prevail indefinitely.

There is an appeal for the naturalist in this country that cannot readily be described. I suppose that it is so totally different from most country that many of us have seen or lived in that it intrigues our interest. For all of its flatness, it is a region of strong contrasts. The open glades or prairies, the pine woods and the hammocks are sharply defined. A plant ecologist could find problems for a life's work in any square mile on the Key. The evolution of a hammock can be seen from a unit measure of a two-foot willow tree in a small sink hole to that of Paradise hammock, a square mile in area with several hundred species of plants. To the malacologist it leaves little to be desired. Problems of speciation in the color forms of *Liguus*, methods of dispersal, adaptation, local distribution and life histories offer a multitude of studies.

We had noted numerous empty shells of *Ampullaria paludosa* Say on the canal banks near camp. No live snails had been seen in the canal though a few had been found in the solution or sink holes in the glades. One night rather late,

after a feast of grapefruit we proceeded to the canal with the flashlight to wash up. A pair of live *Ampullaria* were found slowly crawling along the bank. Investigation of two hundred feet of canal yielded over 100 specimens. During the day this mollusk had been buried in the mud and algae in the deep water of the canal. At night, protected by darkness, it could feed at leisure along the bank. The presence of many large birds that feed on them has probably been a factor in producing this habit. Elsewhere in Florida these snails have been easily found during the daytime.

Ampullaria must be an important food item for many birds if their dead shells can be considered an index. Lang[1] has published an account of the feeding habits of *Rostrhamus sociabilis,* the Everglades Kite on *Ampullaria* in British Guiana and in all probability the same thing occurs with the kites in the Everglades. *Planorbis intercalaris* Pils. must as well offer an abundant food supply for birds as it is very common in many sections of the open glades.

After five successful weeks we drove to Miami, Schevill and I returning directly by boat to New York. Dr. Pilsbry remained over a few days with relatives in Coconut Grove.

There is much country still unknown and we have hopes that in the future more trips can be made for *Liguus* exploration. Frankly, "ligitis" is a serious malady and when once infected a complete cure is impossible. It is seasonal and has a definite periodicity concurrent with the drying up of the glades, the disappearance of the mosquitoes and the first heavy snow storm in the north.

[1] Lang, H. NAUTILUS 37; pp. 73-77, 1924.

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RUGANODONTITES, A NEW SUBGENUS OF SOUTH AMERICAN PEARLY, FRESH-WATER MUSSELS

BY WILLIAM B. MARSHALL
U. S. National Museum

The shells of the genus *Anodontites,* to which this new subgenus belongs, have no hinge teeth, practically no beak sculpture, and but few other characters which can be used for classifying them into groups. The surface sculpture seems to offer one means of dividing them into subgenera or sections, and it is this feature which has been used in defining the new subgenus *Ruganodontites.* Notes are added hereto relating to the minute radial sculpture found on many South American and African Naiades.

RUGANODONTITES, new subgenus of ANODONTITES.

Shell elongate, thick, usually somewhat falcate, with a broad, shallow depression running from the beaks to the middle of the ventral margin. Periostracum thick, microscopically radiately striate, much puckered and wrinkled as if from shrivelling, the wrinkling occurring also in the calcareous portion of the shell. The wrinkles are obscurely divided into narrow, gradually widening rays extending from the beaks to the margin. Nacre greenish-livid. Type *Anodontites colombiensis* Marshall.

1921 *Anodontites colombiensis* Marshall (Proc. U. S. Nat. Mus. Vol. 61, art. 16, No. 2437, p. 7, pl. 1, fig. 5; pl. 2, figs. 13, 14; pl. 3, figs. 5, 13, 14).

1921 *Anodontites crispata* Ortmann (Mem. Carnegie Museum, VIII, p. 589, pl. 40, figs. 7, 8; pl. 41, figs. 2, 3). Not *Anodontites crispata* Bruguiére, 1792.

Type locality: Rio Colorado, Province of Santander, Republic of Colombia. The Colorado is in the Caribbean drainage system. It is tributary to the Rio Magdalena and lies on the western slope of the Cordillera Oriental. High mountains separate the Magdalena and its tributaries from the great areas drained by the Orinoco and Amazon River systems.

The National collection contains the type and three paratypes (Cat. No. 341472) collected and presented by Dr. C. Wythe Cooke. Also two specimens from the Rio Sucio, near Dos Bocas, Santander, Republic of Colombia (Cat. No. 365,-313) collected and presented by Mr. T. A. Link. Also two specimens (Cat. No. 381553) from Rio de la Paila, at Paila, Republic of Colombia, presented by the Carnegie Museum. This river is a tributary of the Rio Cauca, which in turn is tributary to the Magdalena, which it joins about 100 miles from the Carribbean Sea. These specimens were collected by Eigenmann in 1912, and were part of the lot treated by Ortmann (l. c.) as *Anodontites crispata* Bruguiére.

This species is important not only as being the type of the new subgenus, *Ruganodontites,* but also as being the species which Ortmann took to be the true *A. crispata* Brug., the type of the genus *Anodontites.* Had Ortmann's identification been correct it would have resulted in throwing *Styganodon* von Martens into the synonomy of *Anodontites* s. s., but *Styganodon* (type *A. tenebricosa* Lea) is subgenerically different from *Anodontites* s. s. (type *A. crispata* Brug.), and *A. crispata* Ortmann is subgenerically different from both. (See Marshall, NAUTILUS XLIII, pp. 128-131, 1930.)

At present the only other species known to fall into the new subgenus is

ANODONTITES (RUGANODONTITES) NAPOENSIS Lea.

1868 *Anodonta napoensis* Lea (Proc. Acad. Nat. Sci. Phila., Vol. 12, p. 162; Journ. Acad. Nat. Sci., Vol. 6, p. 324, pl. 53, fig. 157).
1869 *Anodonta napoensis* Lea (Obs. on Genus Unio, Vol. 12, p. 84, pl. 53, fig. 157).
1900 *Glabaris napoensis* Simpson (Proc. U. S. Nat. Mus., Vol. 22, No. 1205, p. 920).
1914 *Anodontites* (*Anodontites*) *napoensis* Simpson (Descr. Cat. Naiades, Vol. 3, p. 1417).

The National Museum contains Lea's type (Cat. No. 25429) and one other specimen also received from Lea (Cat. No. 86608). Both came from the Napo River, Ecuador. This is in the Upper Amazon drainage. The periostracal sculp-

ture and that of the underlying calcareous portion of the shell almost exactly minic this feature of the type species.

The fact that the new subgenus is based mainly on sculpture will testify that I count this feature of considerable importance in the South American Naiades. As a rule the naiad shells are so large and of such crude structure that the use of a lens and the microscope have been neglected in studying their external details. In 1922 while I was examining with a lens a specimen afterward described as *Diplodontites cookei*, the light by mere accident fell upon the specimen in such a way as to show hints of a minute, radial sculpture of a kind hitherto unknown in the Naiades. Microscopical examination revealed exceedingly fine radiating threads, numbering 90 or more to the millimeter. Examination of many of the South American and some of the African Mutelidae proved that similar microscopic sculpture occurs on practically all specimens in good condition.

It is necessary to explain here that in this paper the family name Mutelidae is used in the sense in which it was used by Simpson in 1900 in his Synopsis of the Naiades, and is equivalent to Ortmann's subfamily, Mutelinae. As defined by Ortmann, his family Mutelidae includes not only Simpson's family Mutelidae in a subfamily Mutelinae, but is enlarged to include also a subfamily Hyriinae for all other South American Naiades then known and which had been placed by Simpson in the family Unionidae. The Hyriinae have *glochidia*. Ortmann has figured a number of them; and I have seen them in at least one species, *Diplodon huapensis* Bartsch. According to Ihering the Mutelinae have *lasidia*, which, consisting of three pieces, are essentially different from *glochidia* which have but two pieces. *Glochidia* and *lasidia* could not logically be placed in the same family. Therefore, at the present time Ortmann's classification can not be accepted as more than a suggestion. If it be proved that Ihering's observations were erroneous (as we are inclined to think they were) and that the Mutelinae have *glochidia*, not *lasidia*, then the way is cleared for acceptance of Ortmann's arrangement. Just now the most important

need in the study of the South American Naiades is confirmation or denial of the correctness of Ihering's statements concerning *lasidia*. At present he is the only one claiming to have seen embryos of that kind.

Examination of great numbers of Naiades of families other than the Mutelidae shows that this fine sculpture apparently is found in the Mutelidae only. It seems marvelous that for more than 130 years it could have escaped the attention of naturalists, including Bruguiére, who described the first species, *Anodontites crispata*, in 1792. It was somewhat of a shock to me to realize that I, too, in 40 years' work, had never seriously studied the external features of these shells under high magnification and that the finding of new details was due to an accident and not to my own, directed intelligence. Since then the Naiades have had a new meaning to me, and now I do not feel that I have made a full acquaintance with the shell of any particular species until I have examined it in five ways, viz.: 1st by touch and "heft;" 2d by the unaided eye; 3d by the use of a fairly strong hand lens to bring out sculpture, which, though evidently present, is too small for the eye to interpret. The use of great magnification at this stage results in making things too big for the eye to appreciate. 4th by the use of a microscope to bring out minute details. 20 to 50 diameters is usually sufficient, and, of course, reflected light should be used. 5th by immersing a portion of one valve in boiling potash-solution for a few minutes in order to remove the periostracum from that part. The sculpture on the white calcareous surface of the shell will be found to be the same as that seen on the periostracum by the unaided eye, or by the use of a hand lens. The microscopic radiating threads remain invisible, probably because the calcareous surface is much pimpled and pitted by the ends of the tiny hexagonal prisms of the prismatic structure.

In addition to the above it is well to have also some weather-worn specimens. A broken specimen will show the thickness of the prismatic and nacreous layers. In some of the South American Mutelidae the former is very thick, and

its color throughout may be white, or sometimes of a delicate pinkish or greenish tint.

It is generally believed that the faunae of South America and West Africa are distinctly related. The microscopic sculpture of the Mutelidae of the two regions offers another though slight confirmation of this belief. If the Mutelidae of the two regions had a common ancestry it is striking that a minute detail like this should have survived the great changes wrought by Nature through the use of time, place, circumstance, segregation, or any or all of the elements which are supposed to enter into the variations found in animal form and structure.

Still unanswered is the old query: "Which came first, the hen or the egg?" The survival of details during the proggress of variation might give rise to another query: Which lasts longer, basic structure or apparently unimportant details?

DESCRIPTION OF A NEW DESERT HELICID SNAIL

BY HENRY A. PILSBRY AND STANLEY C. FIELD

HELMINTHOGLYPTA GRANITICOLA ARIDA, new subspecies. Vol. 44, pl. 7, fig. 5.

Hill opposite cement quarry, 5 miles north of Victorville, San Bernardino Co., California. Type and paratypes coll. ANSP., collected by Mr. Stanley C. Field; other paratypes in his collection.

The shell is depressed, umbilicate, the umbilicus contained 6 to 6½ times in the diameter: between cinnamon-buff and chamois colored, with a narrow chestnut band above the periphery. The surface is somewhat glossy. First third of a whorl is smoothish, followed by an area of rather coarse radial wrinkles, partly interrupted into oblong granules, continuing nearly to the end of the first whorl, then changing to fine, wavy radial wrinkles. On the intermediate

whorls there are retractive growth wrinkles and forwardly descending series of minute rather inconspicuous papillae, which are scarcely visible on the last whorl, where the wrinkles are smooth or in places slightly roughened. The whorls are convex and increase slowly. The suture is rather deeply impressed throughout, and descends very little in front. The aperture is shortly oval, peristome very narrowly expanded basally, slightly dilated at the columellar margin.

Height 9 mm., diam. 15.5 mm.; 5¼ whorls.

This form differs from *H. mohaveana* (=*H. riparia*) and *H. jaegeri* by its more closely coiled whorls, the last one noticeably narrower in an apical view. It resembles *H. graniticola* Berry in this respect, but dffers from that by the decidedly wider umbilicus, contained 6 to 6½ times in the diameter, while in *H. graniticola* it is contained 8 times.

NOTES ON ACMAEA FUNICULATA (CARPENTER)

BY G. D. HANNA AND ALLYN G. SMITH

There seems to be much uncertainty regarding this interesting shell. It was described only too briefly by Carpenter from Monterey, California, in 1864, and has never been figured. Pilsbry gave a translation in 1891, and this was copied verbatum by Oldroyd in 1927. The little additional published information may be found in the citations below.

We recently enjoyed a day of dredging in Monterey Bay, and among other interesting things we obtained a fine shell of this form. It was "dead" but in excellent condition.

While discussing the generic determination recently with Mr. George Willett, he agreed that there was some doubt as to the correctness of the assignment to "*Acmaea*" where it has been placed since Pilsbry wrote his treatise. Mr. Willett had much additional information to offer. He has dredged it at Forrester Island, Alaska, and in the channel

between Catalina Island and the mainland he obtained the largest and most beautiful specimens we have seen. He very kindly supplied the following notes for inclusion herewith:

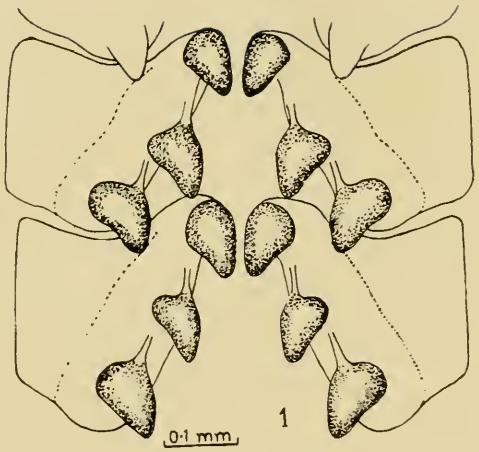
"The only specimen of *Acmaea funiculata* I have taken in Alaska was dredged in 20 fathoms off Forrester Island. It is a small one, measuring in millimeters 10.7x9.3, alt. 5.5. Of seven specimens dredged in 30 to 40 fathoms off Catalina Island, the largest measures 20x17.5, alt. 11.8. An exceptionally elevated example measures 17.7x15, alt. 12.5. I have examined hundreds of specimens of *Acmaea mitra* without finding any intergradation with *funiculata*."

Some of his specimens were living when dredged and he preserved one in alcohol, which he offered to us for study. An examination of this shows conclusively that it does belong to *Acmaea* (*sensu stricto*) and has been correctly assigned a place close to the type of the genus, *A. mitra Eschscholtz*, 1830.

The animal has no branchial cordon and the branchial plume is far back on the left side of the neck. The radula has three teeth on each side of the median line as in *A. mitra* but the shape of the individual elements differs considerably from Dall's and Pilsbry's drawings of *mitra*. (See Amer. Journ. Conch, vol. 6, 1871, p. 241, pl. 14, fig. 1; and Man. Conch., vol. 13, 1891, p. 7, pl. 42, fig. 82). In that species, the teeth are broadly cordiform while in the Catalina Island *funiculata*, they are decidedly more pointed and not heart-shaped. These differences are so pronounced that figures of both radulae are reproduced herewith.

In a group of animals known to vary so widely as *Acmaea*, observations should be based on numerous individuals but in this case, as the radular differences are so pronounced and other characters are likewise different, it seems that *funiculata* should be considered as a species distinct from *mitra*, and not as a subspecies or variety.

The strong, radial ribbing of *funiculata* is well known to those who are familiar with the form at all; in *mitra*, however, there is no trace of radial sculpture except "occasion-



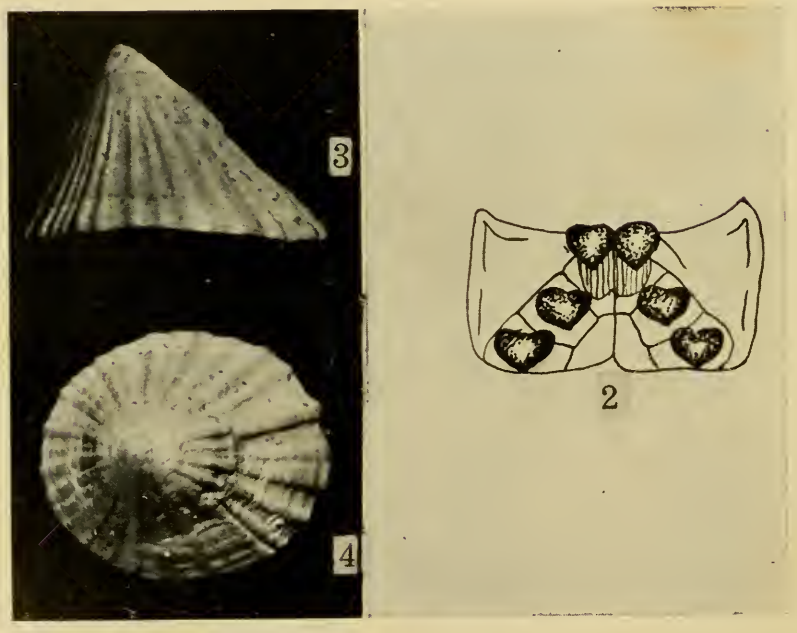


Fig. 1. *Acmaea funiculata* (Carpenter). Radula from specimen dredged by George Willett between Catalina Island and San Pedro, California.

Fig. 2. *Acmaea mitra* Escholtz. Radula, after Dall, Amer. Jour. Conch vol. 6, 1871, p. 241, pl. 14, fig. 1.

Figs. 3, 4. *Acmaea funiculata* (Carpenter). Plesiotype No. 5412, Calif. Acad. Sci. Length 8.0 mm.; width 7.0 mm.; altitude 5.0 mm. Dredged in Monterey Bay, California, between Pacific Grove bell buoy and Del Monte wharf in 25 fms.; July 20, 1920. Photographs by A. E. Burns, Pacific Telephone and Telegraph Co., San Francisco.

ally" (according to Dall and Carpenter) in very young individuals. The habitat is likewise different. *A. mitra* is a common littoral species from Alaska to San Diego, but the ribbed *funiculata* has not been found except by dredging in fairly deep water, 20 to 50 fathoms, so far as we have been able to determine.

Carpenter's original specimen was dredged by Cooper in 1861 off Point Pinos, Monterey Bay in 20 fathoms and the latter has stated that he obtained six specimens (Amer. Journ. Conch, vol. 6, 1870, p. 60) but the location of any but the type is not known to us. They may have been in the California Academy of Sciences where many of Cooper's shells were deposited; if so, they were destroyed in the fire of 1906. The type, however, is preserved in the National Museum and Mr. Wm. B. Marshall has advised that it bears number 14799. (Letter, Nov. 28, 1930). He further stated that: "In our collection Dall treats *A. tenuisculpta* Carpenter as a synonym of *funiculata*, and, I think rightly. The type of *tenuisculpta* is No. 15490 from Neah Bay, Washington; the largest specimen, one of the type lot measures, length 21 mm., width 17 mm. The largest specimen of *funiculata* in the collection measures, length 15 mm., width 12 mm. It is No. 224634 from U. S. Bureau of Fisheries Stat. 2944, 30 fms. rocky, surface temperature 59°, Lat. 34° 00′ 00″, Long. 119° 28′ 30″, near Santa Cruz Island, California, Feb. 6, 1889.

It seems clear that *funiculata* may not reach the large size of *mitra*, and it is almost always free from the coralline algal growths and serpula borings so characteristic of the latter. In the young stages, however, *mitra* is often clean and it so happens that a good series was obtained in Monterey Bay at various times, chiefly by dredging; there is not a trace of radial sculpture in any of the lot. In addition to the specimen of *funiculata* from Monterey, illustrated herewith, we have three smaller ones from Carmel Bay. They show the same pronounced radial sculpture.

It also appears that *funiculata* is usually more acutely conical than *mitra*, more ovate in outline and the basal

plane is more definitely concave, this being almost flat in *mitra*.

In view of the differences noted, and the absence of definite intergradation with *mitra* it seems that *funiculata* should be held to be a distinct species and the following synonymy is accordingly offered:

ACMAEA FUNICULATA (Carpenter). Pl. 2, figs. 1, 3, 4.

Scurria ? *var. funiculata* CARPENTER, Rept. Brit. Assoc. Adv. Sci. 1863 (1864), pp. 612, 650; "*Scurria* (? var.) *funiculata*. Monterey; rare." (p. 612). "*Scurria* ? var. *funiculata*. With rounded riblets, somewhat nodulous." Monterey, Cooper (p. 650).

Scurria (?) *funiculata* CARPENTER, Proc. Calif. Acad. Nat. Sci. vol. 3, 1865, p. 214.

"*Scurria* (?) *funiculata*, Cpr. (?) n. s. State Collection, No. 466*d*.

"? Sc. t. parva, albida, regulariter conica, apice acuto, elevato, parum antrorsum rito; liris validis, rotundatis, interdum vix nodulosis, irregulariter, huc et illuc duplo (dupliciter ?) vel tripliciter dispositis; margine a costis extus undato; cicatrice haud conspicuo. Long. 0.50, lat. 0.38, alt. 0.26, div. 80°. Hab. Monterey, 6 dredged dead, Cooper.

"So different from the most strongly marked young specimens of *Sc. mitra* that I presume it to be distinct. The genus depends on the animal, which has not yet been seen."

Scurria (? var.) *funiculata* CARPENTER, American Journ. Conch. vol. 2, 1866, p. 347. (Above latin diagnosis repeated verbatum).

"Long. 0.24, lat. 0.18, alt. 0.12 11., div. 80°. Habitat.—*Monterey, Cooper.*

"One very small specimen was sent by Dr. Cooper to the Smithsonian Institution, so different in sculpture from the most strongly marked specimens of *Scurria mitra*, that I presume it to be distinct. The ribs, which are stout for the size, are sometimes single, sometimes gathered into twos and threes; with wide interspaces, in which intercalary riblets appear.

Scurria mitra var. funiculata CARPENTER. COOPER, Amer. Journ. Conch. vol. 6, 1870, p. 60.

"Str. Fuca to Monterey; deep water, 6 dead, 20 fms. Near Pt. Pinos."

Acmaea mitra var. *funiculata* CARPENTER. DALL, Amer. Journ. Conch, vol. 6, 1871, p. 242; "The striated variety *(tenuisculpta*, Cpr.) appears very distinct from the smooth form, but every gradation may be found in a very large series. The unique type of *Scurria? funiculata*, Cpr., now before me, differs from the smallest specimen of *tenuisculpta*, only in having the riblets even more prominent, close,

rounded, and being thinner and smaller. It appears to me to be only a very marked and probably individual variation. It may, however, eventually prove conspecific with '*Patella Lamanonii*' Schrenck, (Amurl. moll.) which is with little doubt the same as '*Patella pallida*', Gld. (Proc. Bost. Soc. Nat. Hist. 1859)."—PILSBRY, Man. Conch, vol. 13, 1891, p. 25; "Shell small, whitish, regularly conical, apex acute, elevated, a little in front of the middle; sculptured with strong rounded riblets, sometimes a little nodulous; sometimes single, sometimes gathered into two's and three's; with wide interspaces in which intercalary riblets appear." Length 6, breadth 4½, alt. 3 mill. *Monterey, California.* (Translation of Carpenter's Latin diagnosis).

"A curious small shell, having the contour of *A. mitra*, but with strong, smooth, crowded, unequal ribs. The measurements are from the type in the Smithsonian Institution."—DALL, Bull. 112, U. S. Nat. Mus. 1921, p. 168; "Shumain Islands, Alaska, to Magdalena Bay, Lower California."—OLDROYD, Stanford Univ. Publ. Geol. Sci. vol. 2, pt. 3, 1927, p. 145; (Pilsbry's translation quoted).

Scurria mitra var. tenuisculpta CARPENTER, American Journ. Conch. vol. 2, 1866, p. 346. (Very short description of the form of *mitra* which shows faint riblets near the apex; no locality given; no figure).—PILSBRY, Man. Conch. vol. 13, 1891, p. 25; "Sculptured with distant radiating striae or lirulae."

Acmaea var. *funiculata* CARPENTER, DALL, Nautilus, vol. 28, 1914, p. 14, "Merges by imperceptible degrees into the later *tenuisculpta* and that into *mitra* Eschscholtz."

BOSTON MALACOLOGICAL CLUB

The Boston Malacological Club has held its meetings during the past season, in the Library of the Boston Society of Natural History, on the first Tuesday evening of each month, from November to May, inclusive, the October meeting having been omitted.

At the first meeting, the Club was addressed by a former member, Mr. William F. Clapp, who told of his floating laboratory for the study of marine biology, made on an old schooner, which has been refitted to the requirements for research work. Mr. Clapp also spoke of his work for the government, in investigating the food of our edible fishes, and of the need of enlarging our list of these.

In December, Dr. David L. Belding told of the "Life History of the Atlantic Salmon" and of his research work along the shores and rivers of Eastern Canada. Several reels of moving pictures added much to the interest of the subject.

Mr. Allan F. Archer spoke at the January meeting, on a "Summer Collecting Trip in Cuba". He was fortunate in meeting several of the Cuban collectors, and arranging trips with them. These were in the provinces of Matanzas, and Pinar del Rio, where his search was rewarded by specimens of Urocoptis, Condropoma, Helicina, and Regina, as well as by nine different color-forms of Liguus, which formed an interesting exhibit.

In February, Mr. Charles W. Johnson gave a paper entitled "Historical Reminiscences" dealing with the lives and achievements of twelve New England conchologists. These were Amos Binney, his son William G. Binney, Joseph P. Couthouy, Charles B. Adams, Robert E. C. Stearns, William Stimpson, William H. Dall, Jesse W. Mighels, John G. Anthony, Augustus A. Gould, Addison E. Verrill, and the Malacological Club's first president, Edward S. Morse.

The March meeting was given to a paper on Cephalopods, by Prof. P. E. Raymond of Harvard, who described the structure and habits of the very early forms, and from them traced the descent of the present forms.

At the April meeting the Club listened to a talk by Dr. Hervey W. Shimer, Professor of Paleontology at the Massachusetts Institute of Technology, on "What is the use of fossils, anyway?". Dr. Shimer spoke first of the interest found in the study of paleontology, from the standpoint of history, and of the development of the plants and animals of the earth from the forms of many million years ago, and then of the value which a knowledge of the subject brings to modern economics. He gave as one instance of this, the discovery of oil fields by the finding of certain fossils—and as another, the use of inferior material in a roadbed, proved conclusively by finding in it fossils which could not possibly have been in the stone for which the contract called. Many lantern slides added to the interest of Dr. Shimer's paper.

Mr. William J. Clench, of the Museum of Comparative Zoölogy, at Harvard, spoke at the May meeting, giving an account of a recent collecting trip to Florida, where Long Pine Key, in the Everglades, was the field of his activities, and Liguus the object of his trip. He exhibited a superb set of Liguus.

The May meeting being the Annual meeting, the election of officers took place, three of these being re-elected. They were: President, Mr. Francis N. Balch; Vice-President, Mr. Allan F. Archer; Secretary-Treasurer, Miss Theodora Willard; Executive Committee, Miss Mildred Seymour, Mr. Harold A. Rehder.

On May 27th the Club held its annual Field Day. Seventeen members and six guests went by motor to Marion, Mass., cars being furnished by several members, and two hours were spent in collecting *Helix nemoralis* in the special locality where they flourish plentifully. After a picnic luncheon under the trees, the party went on several miles to a beach near Wareham, where, although the tide was nearly full, thirty-two species of shells were found.

The day was a perfect one, with a warm sun and a cool breeze, and the trip was greatly enjoyed. This brought the Club's twenty-first year to a close.

THEODORA WILLARD, *Secretary.*

NOTES AND NEWS

MOLLUSKS OF BARRO COLORADO ISLAND.—In the last Report of the B. C. I. Biological Laboratory Mr. James Zetek has given a list of 30 species of mollusks collected on the Island. No doubt numerous additional species remain to be discovered on this lovely island.

MR. H. N. LOWE has been working on his West Mexican and Central American collections at the Academy of National Sciences of Philadelphia since the Malacological Union meeting.

THE CHARLES TORREY SIMPSON PARK.—Those who have hunted *Liguus* in the old time Brickell Hammock at Miami, before the marvellous expansion of that city over it, will be glad to hear that a part of the old hammock which remains unchanged has been made a city park, dedicated on April first to Dr. Simpson. It is a well-deserved honor to a veteran naturalist.—H. A. P.

News has been received of the death of MAJOR PAUL DUPUIS of Brussels on May 1st. Major Dupuis is chiefly known to America conchologists by his papers on land and freshwater shells of the Belgian Congo, collected by himself during some years of service there. Since the war he has been Conservator of the Musée Royal d'Histoire Naturelle.

MR. FRANK C. BAKER was elected first Vice-President of the Illinois State Academy of Sciences at the recent Peoria meeting.

DR. H. BURRINGTON BAKER is collecting mollusks of Idaho and adjacent States for his anatomical and systematic studies.

The death of BENEDYKT DYBOWSKI, on January 31, 1930, at the age of 97 years has been announced. He is best known as an investigator of the Lake Baikal fauna.

REPORT ON THE [BLAKE] MOLLUSCA: GASTROPODA AND SCAPHOPODA, by Wm. H. Dall, Bull. Mus. Comp. Zool., vol. XVIII, is wanted by James Zetek, Drawer Z, Balboa, Canal Zone. Anyone having a copy to dispose of will please communicate with him.

POLYGYRA EDWARDSI MAGNIFUMOSA (Pils.) was picked up by Prof. C. R. Crosby at Highlands, Macon Co., N. C., the specimens sent to me by Prof. S. C. Bishop.—H. A. P.

SNAILS FORCE FLIERS TO MOVE.—British Royal Air Squadron abandons Irak base because of pests.—The Daily Mail (London, May 18) in a dispatch from Basra, Irak, says snails compelled the British Royal air force to abandon its base at

Lake Habbanya, near Bagdad. The site of the intended camp was found to swarm with myriads of snails which carried germs of the disease bilharziasis, which British troops during the World war dubbed "Bill Harris". It is more commonly known as schistosomiasis, and causes internal bleeding. The correspondent said that Basra would now probably be chosen as the site for the base.—BOSTON HERALD, May 18, 1931.

NOTE ON CALIFORNIA SHELLS OF THE HELMINTHOGLYPTA CUYAMACENSIS GROUP.—I was rather surprised recently to find specimens of a species and subspecies of this group at a considerable distance from locations mentioned by Dr. Bartsch (Calif. Shells of the *traski* group, Proc. U.S.N.M., Vol. 51, p. 610) when he described them.

The type and only specimen of *H. cuyamacensis avus* Bartsch is stated to have come from Los Angeles County; specimens have been found recently by me in the foothills of the Tehachapi Mts. in San Bernardino County.

The type of *H. cuyamacensis venturensis* Bartsch is stated to have been collected by Yates in Ventura County, and another specimen on hand is without specific locality. I found a large colony of these under logs at the Eastern end of the Soledad canyon road in Los Angeles County.

I have not been able to find any report of these shells other than given by Dr. Bartsch, and the locations in which I found them are separated from the type localities by many hills and valleys that have been well collected over, and at certain angles by wide expanses of flat desert.—STANLEY C. FIELD.

MITRA LOWEANA, n. n. for *Mitra lowei* Dall, Proc. Biol. Soc. Wash. 16: 173 (1903). Not *Mitra lowei* Dohrn, Proc. Zool. Soc. Lond., 1862: 203.—PILSBRY.

JAPANESE LAND MOLLUSKS.—Certain forms having been distributed from Japan under manuscript names are here provided with definitions.

PUPINELLA RUFA, n. form ALBA.—Shell white throughout. Hirado, Hizen. Type and paratypes, 82268 A.N.S.P.

HIRASEA NESIOTICA LIOBASIS, n. subsp.—The shell differs from *H. nesiotica* by having the base nearly smooth in the middle, weakly striate near the periphery, while in *H. nesiotica* there are fine, distinct striae over all but the umbilical region. Diam. 4.2 mm. Chichijima, Ogasawara. Type and three paratypes, 87516 A.N.S.P.—H. A. PILSBRY.

OTESIA CERASINA REDUCTA, n. subsp.—Much smaller than *"Macrochlamys" cerasina;* alt. 3.7 mm., diam. 5.5 mm., 5 whorls. Yutagawa, Uzen. Type and paratypes, 87544 A.N.S.P.

EUHADRA MERCATORIA, n. form. PERVERSA.—Shell sinistral. Loochoo (87524 A.N.S.P.) ; also taken on Kumejima.—H. A. PILSBRY.

HELIX BELCHERI Pfeiffer.

Proc. Zool. Soc., London, 1845, p. 128.

Conch, Icon VII, pl. 190, f. 1328.

In Proc. Acad. Nat. Sci. Philadelphia 82, p. 423, Prof. H. Burrington Baker refers to this species as an "ancient *nomen dubium* of unknown habitat". The dimensions given by Pfeiffer show that Reeve's figure is, roughly, about twice natural size, though no indication is given to that effect. As Pfeiffer states explicitly that it is described from the Cuming collection, I thought it would be well to try and settle its identity, and after a prolonged search at the British Museum I found the type lot of three specimens labelled in Pfeiffer's handwriting, "H. belcheri Pfr., brought by the Sulphur, Capt. Belcher, 1842". They are evidently a young Streptaxid, and very careful and detailed comparison has fixed them as *S. apertus* Martens.—J. R. LEB. TOMLIN.

A PREVENTATIVE FOR THE SCALING OF THE PERIOSTRACUM. —The method given below has been employed to prevent the scaling of the periostracum, the cracking and the complete fragmentation of certain shells due to drying.

Dissolve 4 oz. of paraffin in 300 cc. of xylol over water bath or by placing on a radiator. Shells can then be dipped

in this solution and allowed to dry for a few hours. The xylol evaporates and leaves a thin film of paraffin over the surface. If needed, the paraffin is readily removed by placing in xylol or in warm water.

The method has given complete satisfaction in preventing the fragmentation of *Paryphanta* or other genera possessing a heavy periostracum and only a small amount of calcium carbonate. It also prevents the cracking of the Unionids and the scaling of the periostracum in such genera as *Cyprina* and *Egeria,* etc. It has many advantages over the use of petroleum jelly and glycerin, both of which soil labels, trays, and also in its permanency. It is much superior to various forms of shellac as it can be readily removed and does not change the appearance of the shells.—WILLIAM J. CLENCH.

EPITONIUM FALLACIOSUM.—In attempting to identify Pleistocene wentletraps from San Pedro it became necessary to fix the status of *Epitonium fallaciosum,* a name proposed by Dall (U. S. Nat. Mus. Proc., vol. 53, p. 478, 1917) for a California species that Carpenter confused with the Panamic *E. hindsii* (Carpenter). No type material was designated, so any specimen of any California species that Carpenter referred to *hindsii* is available, though a lectotype should be chosen from Carpenter's material that was available to Dall. Any discussion of the status of *fallaciosum* based on a later usage by Dall or anyone else is irrelevant so long as a type is not selected. I herewith designate as the lectotype a specimen in a lot of five from San Pedro labeled "*Scalaria hindsii* Cpr., San Pedro, P. P. C.[arpenter]" (U. S. Nat. Mus. Cat. No. 46222; length 17.7 mm., diameter 6.7 mm.; 11 varices.) This selection restores the name *fallaciosum* to the species Dall undoubtedly had in mind and makes *E. cooperi* Strong (San Diego Soc. Nat. Hist. Trans., vol. 6, No. 7, p. 194, 1930) a synonym of *fallaciosum.*—W. P. WOODRING.

DREPANIDA, NEW NAME FOR DREPANIA Lafont, PREOCCUPIED.—In 1874 A. Lafont proposed the name *Drepania* for a new genus of nudibranch mollusks, with *Drepania fusca* Lafont, from the Bay of Arcachon, France, as the type species

(Journ. de Conchyliologie (3), XXII, 14, p. 369). A second species, *D. graeffei* Bergh, from Trieste, was added in 1881, and a third, *D. tartanella* von Ihering, from Naples, in 1885, the latter being probably identical with the Trieste species.

In 1901 Cockerell described a new species of Dorid from San Diego, Calif., as *Thecacera velox* in the Journal of Malacology, VIII, 3 p. 87. In a more detailed study of the last named species I have recently shown (Proc. Calif. Acad. Sci. (4), XVIII, 15, 1929, p. 495) that it is not a *Thecacera,* but belongs to the genus *Drepania* as fixed by Lafont. By the kindness of Professor Cockerell my attention has been called to the previous use of the name *Drepania* by J. Huebner for a genus of Lepidoptera in his "Verzeichniss bekannter Schmetterlinge", 1816, p. 149. The name is therefore preoccupied and cannot be used. I here propose the name of *Drepanida* as a substitute for *Drepania* Lafont. The species at present known belonging to this genus are the following:

1. *Drepanida fusca* (Lafont). Arcachon.
2. *Drepanida graeffei* (Bergh). Trieste, Naples.
   Drepanida tartanella (von Ihering). Naples.
3. *Drepanida velox* (Cockerell). San Diego, La Jolla.

—F. M. MacFarland, Stanford University, Calif.

Schizothaerus nuttallii and varieties on Puget Sound.—In the October issue of The Nautilus, Frizzell places my Big Hope Island, Pleistocene record of *S. n. maxima* Middendorff under the name *S. n. capax* Gould, on the ground that they are exact synonyms and that Middendorff's name *maxima* is preoccupied by *Lutraria maxima* Jonas, 1844. Carpenter's assertion, to which he refers as though it settled the matter, that "this species" assumes both elongate and rotund varieties which completely intergrade, is inclusive. The fact that intergrading specimens may be found at various localities is precisely what should be the case if they are subspecies or varieties; otherwise they would be considered distinct species. However, I am now inclined to believe that *maxima* Midd. and *capax* Gould are synonymous, but it does not at all necessarily follow

that the Big Hope Island material is *capax*. Instead of being "*a* rotund specimen," as Frizzell assumes, the Big Hope material consists of 21 specimens in good preservation and much broken, discarded material. This collection was carefully compared with a large collection of typical recent *capax* from two localities on Fidalgo Island, from two to five miles distant. The difference is constant, the Big Hope fossil material being invariably thick, very coarse and rough, proportionately higher and the beaks more nearly central than in any recent material I have seen from there or elsewhere. A large proportion of described and named subspecies and varieties are based upon variations everywhere mingled, with no pure colonies. Surely where pure colonies are found, as in the present instance, there is greater reason for recognizing the variations by name. I have not access to either Jonas' or Middendorf's works, for the purpose of determining whether *maxima* is in fact preoccupied, but Carpenter cited Middendorf's name as *Tresus maximus*, while Mrs. Oldroyd cited it as *Lutraria maxima*. Anyhow, it seems probable that it is a synonym of the recent *capax*, and is therefore not available for the Big Hope Island form. I have found no other name which seems applicable. Hence the fossil form from Big Hope may be known as *Schizothaerus nuttallii bighopensis*.—JUNIUS HENDERSON, University of Colorado.

MODIOLUS LAM., 1799, VERSUS VOLSELLA SCOP., 1777.—In Special Publication No. 3, Acad. Nat. Sci. Phila., p. 98, Aug., 1930. Dr. Ralph B. Stewart in making Modiolus a synonym of Volsella says: "There seems to be no escape from it. Inasmuch as *Mytilus modiolus* was the first species cited by Scopoli and the only Linnean species, it is certainly eligible as type of Volsella as selected by Gray even though it does not correspond to the original diagnosis of the genus. Scopoli did not realize that *Mytilus modiolus* was edentulous." Is this science or just a little juggling in nomenclature? One rule that we cannot very well set aside calls for a recognizable description or figure. Scopoli gives us neither. Trying to make an

edentulous shell the type of Scopoli's Volsella will not work. Systemists owe something to biologists and should take into consideration the result of an unnecessary change like this before advancing it.—C. W. JOHNSON.

THE LAND MOLLUSKS OF JEFFERSON, LINCOLN CO., MAINE. —The following is a list of land mollusks that were obtained in a bush covered stretch of land between Three-Corner and Clary Lakes. *Polygyra albolabris* (Say). *P. fraterna* (Say). *Retinella binneyana* (Morse), very common. *Glyphyalina indentata* (Say). *Euconulus fulvus* (Mull.) *Zonitoides arborea* (Say), very common. *Pseudohyalina limatula* (Ward). *Agriolimax campestris* (Say). *Gonyodiscus cronkhitei catskillensis* Pils., very common. *Helicodiscus parallelus* (Say), common on a leaf covered bank above Three-Corner Lake. *Succinea ovalis* (Say), very common. *Vallonia pulchella* (Müll.), in an old cemetery.—ALLAN F. ARCHER.

ARCHEO-CONCHOLOGICAL CARIBBEAN EXPEDITION OF 1931. —Under the auspices of the American Museum of Natural History, Mr. H. J. Boekelman is planning a trip in the interest of "Archeo- and Ethno-Conchology, The study of man's use of shells". The expedition plans to cover the Greater and Lesser Antilles, the northern coast of South America and the eastern coast of Central America. The subject as outlined in a four paged paper is very interesting, and the work will no doubt add much to our knowledge of the prehistoric life of the aborigines.—C. W. J.

PUBLICATIONS RECEIVED

SOME NOTES ON LIVER-FLUKE INVESTIGATION. By J. N. Shaw. Journ. American Veterinary Med. Assoc., Vol. 78 (n. s. Vol. 31), No. 1, Jan., 1931, pp. 19-24. The liver fluke *Fasciola hepatica,* which infests sheep, and has caused considerable damage in Oregon and nearby states is found to

have as intermediate hosts, *Lymnaea* (*Galba*) *bulimoides* Lea, *L.* (*G.*) *bulimoides techella* Haldeman, and *L.* (*G.*) *ferruginea* Haldeman. Methods for detection of the parasite, symptoms, treatment, and control are given.—G. D. HANNA.

SALMON POISONING. By B. T. Simms, C. R. Donham and J. N. Shaw. American Journ. Hygiene, Vol. 13, No. 2, March, 1931, pp. 363-391.

SALMON POISONING. By B. T. Simms, C. R. Donham, J. N. Shaw and A. M. McCapes. Journ. American Veterinary Med. Assoc., Vol. 78 (n. s. Vol. 31), No. 2, Feb., 1931, pp. 181-195, 2 text figs.

These two papers give an extremely interesting history of the tracing of a parasitic fluke, *Nanophyetus salmincola* Chapin, through various members of the salmon and trout family, then through the intermediate host, our well known western stream snail, *Goniobasis plicifera silicula* Gould, and finally into dogs, foxes and other carnivorous mammals. The disease is often fatal and is very common in those parts of Oregon, Washington and California inhabited by the *Goniobasis*.—G. D. HANNA.

THE GASTROPODS OF THE ST. LOUIS, MISSOURI, PENNSYLVANIAN OUTLIER, ACLISINA AND STREPTACIS. By J. Brookes Knight. Journ. of Paleontology V, March, 1931. These genera of small, slender Gastropods, somewhat Pyramidella-like in form and apical structure, are referred to a new family, Streptacididae. Six species, three of them new, are described.

THE PLEUROCERID GENUS EURYCAELON. By Calvin Goodrich. Occas. Pap. Mus. Zool. Univ. Michigan, No. 223. The genus is characterized by the collumellar notch of the shell and the marginal teeth, the inner and outer being alike, with five or six cusps. Two species are recognized, *E. anthonyi* (Budd. Redf.) of the upper Tennessee and tributaries, and *E. crassa* (Hald.) of the Clinch and Powell rivers, both being described and figured.

A New Shipworm from Venezuela. By Paul Bartsch. Proc. U. S. Nat. Mus., Vol. 79, Art. 8, 1931. *Teredo* (*Neoteredo*) *healdi* from Maracaibo Harbor.

Biology of Cohol (*Ampullaria luzonica* Reeve) a Common Philippine Freshwater Snail. By Andres M. Nono and Andres M. Mane. The Philippine Agriculturist, 19, March, 1931. This snail is used for food and bait. The average period of incubation is 15.5 days. The snails reach mature size (29.18 mm.) in 27 weeks. It is a lowland form, living commonly in irrigated tracts. In the dry season they burrow as deep as 8 to 15 cm. in the soil for the summer rest.

The Naiades or Pearly Freshwater Mussels of Texas. By John K. Strecker. Baylor Univ. Mus. Special Bull. No. 2, 1931. The last catalogue of Texas Unionidae, that of J. A. Singley, enumerated 79 species and varieties, partly accepted from other authors, and only 45 accepted by Strecker as valid Texan forms. To this number 14 actually have been added, making a total of 59 species and varieties positively known from Texas. The distribution of these species is given in detail. A few important streams, such as the Nueces River, are still very little known.—H. A. P.

Neartic Vitreine Land Snails. By H. Burrington Baker. Proc. A.N.S.P. Phila., 1931. The genera considered are *Pristiloma* Anc. with six subgenera of which five are new; *Paravitrea* Pils., with four new subgenera; *Pilsbryna* H. B. B., with *P. castanea,* n. sp., from Dove, Marion Co., Tenn. Keys to the subgenera and species, and anatomical notes on many species are given, with, for comparison, anatomical notes on the Palearctic *Vitrea subrimata.* Eight plates illustrate the anatomy and shells. By this admirable essay, with Dr. Baker's former papers, the systematic relations and nomenclature of our small Zonitidae are at last reduced to satisfactory order.—H. A. P.

WILLIAM GREENE BINNEY,
1833—1909

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WILLIAM GREENE BINNEY

BY ARTHUR F. GRAY

William Greene Binney was born at Boston, Mass., Oct. 22, 1833. The home of his parents was then at 62 Mt. Vernon St. He was the son of Dr. Amos Binney and Mary Ann (Binney) Binney. He was a descendant in the seventh generation from Capt. John Binney of Hull, Mass., 1678-9, fisherman and gentleman, the ancestor of almost all of the name in America. He died there on Nov. 10, 1698; his widow, Mercy, also died in Hull, Jan. 19, 1708-9.

His father Dr. Amos Binney, 1803-1847, was one of the founders of the Boston Society of Natural History, in 1830, its President for four years, and served the society also as Treasurer and Curator. Dr. Binney accumulated an extensive and valuable library on natural history subjects, a large portion of which is now lodged in the library of the Society. During an all too brief life, he gave particular attention to the study of the terrestrial air-breathing mollusks of the United States, he prepared materials and had many fine copper-plates executed for a work on the subject; the results of these studies were afterwards published in three quarto volumes in a monumental form, posthumously, under the able editorship of Dr. Augustus A. Gould.

Binney's early schooling was obtained in the Boston Public Schools and in 1850, at the age of seventeen, he entered Harvard College. Never of a strong constitution, he was obliged to leave college before the time for graduation, on account of continued ill health; however, he returned after an interval, took up his studies and received in 1857 his de-

gree A.B. as of the class of 1854. In 1884 Harvard conferred on him the honorary degree of A.M.

From his father William G. Binney seems to have inherited his taste for natural history, more especially for conchology, and as for many years he remained a semi-invalid, he devoted much time to a close and intimate study of our American land shells, though to a lesser extent he studied some of our fresh-water groups and wrote valuable and much used papers relating thereto (No. 32, 34 and others in the appended bibliography). He carried on his researches with great persistence and care and many of his papers on the lingual dentition, jaws and genitalia of our land and fresh-water shells, are monuments to his patience and skill, not only as a biologist but also as a skilful draughtsman. Thus he carried on his lines of research, following in a very thorough manner the line laid out and so ably started by his father.

We find him publishing papers on various conchological subjects as early as 1856; during the year he also edited "Descriptions of Terrestrial Shells of North American, by Thomas Say", in which all of Say's scattered and generally inaccessible papers relating to our terrestrial species were first brought together. In 1858, he brought forth "The Complete Writings of Thomas Say on Conchology of the United States", this he edited and published in an octavo volume of 252 pages, and reproduced all of Say's plates, some 75 in number, from the original coppers. In 1859 he issued as Volume IV, a supplement to the well-known work of his father on the Terrestrial Air-breathing Mollusks of the United States, some 207 pages, with six colored plates; again in 1878, he published at Cambridge as Volume V, of the same, in 449 pages, with 104 plates and 312 wood-cuts, a most complete and full account of our land Mollusca. Still later and at various dates he issued four supplements to his last volume.

In 1863-4 an important work entitled "Bibliography of North American Conchology, Previous to 1860", appeared from his pen. It was published in two parts, American

Authors and Foreign Authors. In its 956 pages it listed all writers of papers, also gave lists of all species described in them. In 1864, he edited, with George W. Tryon, Jr., "The Complete Writings of Constantine Smaltz Rafinesque on Recent and Fossil Conchology". In 1869, with Thomas Bland, "Land and Fresh-water Shells of North America: Part I, Pulmonata Geophila" appeared, and in 1865 Part II, on the "Fresh-water Shells" by Binney, these highly important publications forming part of the series on the land and fresh-water shells issued by the Smithsonian Institution. All were fully illustrated with wood-cuts.

In 1870 at the request of the Massachusetts Legislature he edited as a Second Edition of Gould's "Report on the Invertebrata of Massachusetts", his well-known "Invertebrata of Massachusetts", an important contribution of 524 pages, with 12 plates and 756 wood-cuts. The latter were engraved from drawings made by the late Prof. Edward S. Morse.

Still later, in 1885, "A Manual of American Land Shells" by him came from the press. This was issued as Bulletin No. 28, by the United States National Museum.

His more important publications are given above, yet he found time to produce a large number of important papers on Mollusca which appeared in the publications of our scientific societies, at comparatively frequent intervals.

For over thirty years he enjoyed a close intimacy with Mr. Thomas Bland with whom he worked and became closely associated. Mr. Bland's intimate knowledge of the land shells of the West Indies and their geographical distribution, gained during his residence in Barbadoes and Jamaica, covering a period of ten years or more, besides a world-wide correspondence with all the important workers both in Europe and America upon that subject, especially fitted him as a mutual friend and co-worker. During their association under joint-authorship some twenty-five papers and books were published. The relationship thus formed was of mutual value to both and continued until Mr. Bland's death in August, 1885.

Mr. Binney also corresponded with nearly all of the active collectors of land shells in North and Central America, as well as many foreign authors, collectors and museums from whom he received many new, undescribed, or little-known species. He published descriptions of many of these, more particularly those belonging to the North American fauna.

Mr. Binney was a member of the principal scientific societies both here and abroad. The inclemency of the weather in Boston forced him to seek a milder climate. Accordingly he visited France, and resided in Paris for two or three years after giving up his work at Harvard. He was married at the American Embassy in that city, March 20, 1855, to Miss Marie Louise Chamberlain, daughter of Judge William Chamberlain of Philadelphia, a brilliant and highly accomplished lady, with whom he lived to celebrate his golden wedding. After his return from Europe, he took up his residence at Burlington, N. J., where his valued contributions to conchology were produced and where he passed away August 3, 1909. His remains with those of his wife, rest in the lot of his father in Mt. Auburn, she having died the year previous. They were survived by their two daughters, Mrs. Frank W. Earl (Marie Binney), of Burlington, N. J., and the Princess Pietro Paulo di Camporeale (Florence Ethel Binney), of Rome, Italy, where she has resided since her marriage in 1888.

The writer enjoyed an intimate and lengthy acquaintance with Mr. Binney from 1876 till he ceased his work on the land shells, and had the privilege of supplying drawings of many shells for his works. A large portion of Binney's library is now in his possession.

Binney's frequent visits to Europe, gave him access to the many foreign museums and art galleries, and he inherited not only the love of nature but that of art from his father. He was a brilliant linguist, speaking the French and Italian tongues fluently, an excellent Latin scholar, a most genial and kindly gentleman, always interested in the younger workers in his favorite branch, giving freely of his time and kindly advice to those who came to him or choose to write

him. In his death America lost one of its most careful and accomplished conchologists.

The bibliography which will appear in the next number of NAUTILUS, while possibly incomplete, shows the extent and value of his services. I trust it may prove of use to searchers for his writings.

SOME CONCHOLOGICAL BEGINNINGS

BY CALVIN GOODRICH

One cannot do the necessarily repeated readings of early descriptions of fresh water mollusks in America without coming to wonder what manner of men did the original collecting, the circumstances of this collecting and, sometimes, where exactly the collections were made. Gradually, one picks up a certain amount of dependable information on the subject. A realization develops of how exceedingly restricted were the means of travel in the first fifty or sixty years of the Nineteenth Century. Customs that are now almost forgotten are revealed. Errors get themselves resolved some way. Probably more than anything else which leaves an impression is that collecting was carried on, in large part, as casually and spasmodically as the school teacher abroad gathers together her impedimenta of souvenirs.

In an incomplete list of names taken from Lea's "Observations" are those of thirteen doctors, only four of whom appear to have been collectors in the strict sense. The others pocketed a few shells as the things met their eyes, and by avenues more or less devious these shells reached Isaac Lea. This is probably why so many of Lea's types are "dead" specimens. The doctor of that day, if he lived west of the eastern seaboard or in the south, was compelled to go about on horseback. He was compelled, too, to hunt for fords, to halt at ferries, to wait with such patience as he had while floods subsided and permitted the resumption of travel. Such

occasions were opportunities whose final results were publication at Philadelphia. Nine of the list were geologists whose duties were broad, and might range from compiling zoological catalogues to recommending sites for mill dams. To the names of two men, the "Esq." is attached. One was of the Darien district of eastern Georgia and the other of northern Alabama, and I suppose that the "esq." in the cases indicated that both were what were known as "gentlemen planters", a designation that Jefferson Davis bore at a period of his life. Three Union army officers found time amid the stresses of the Civil War to send mollusks from their stations. One was in the dust and smoke of Sherman's March to the Sea. Another barely escaped capture during an enveloping maneuver. The Rev. George White, who collected from northern Alabama to middle western Georgia, I take to have been a circuit rider, and if Bishop Elliott could not be called that, he at least journeyed about as a circuit rider did. President Joseph Estabrook had a touch of picturesqueness. He was born in New Hampshire and died in Anderson County, Tennessee. It is written of him that "he was given to elegant ruffles and fine boots, to the prodigious use of snuff, to shooting even on Fast-day and, capping all, to dreams which told him faithfully how to win $5,000 by lottery". Retiring from the presidency of East Tennessee University at Knoxville, he undertook to bore into the earth till he obtained salt. Death ended the enterprise before all his savings had been poured into the hole.

Flowing from the Cumberland Plateau in East Tennessee are two neighboring streams, Daddy's and Mammy's creeks. The old east and west road across the plateau dips steeply into a hollow of an inner fold of Walden Ridge, and in this hollow runs Mammy's Creek. I climbed afoot from Rockwood in the rain several years ago to visit the spot because the creek is the type stream of Lea's *Melania rufa,* later changed to *rufescens.* There was to be no consolation for the rain and mud. The creek was polluted with mine waste. But I am as certain as a person may be in the circumstances that this was the exact type locality. It was the only crossing

made by a main road. It was such a place at which a driver would stop, water and rest his beasts and prepare against the climb up the ascent, as abrupt one way as it was the other. And here a traveler would drop from the stage to ease his legs, peer into the clear, shallow water and bring away a few mollusks which ultimately would come to Dr. Lea. Incidentally, it may be told that the name of the stream provides a measure of the literary politeness of 1841. The Mammy's Creek of the natives became Mamma's Creek in the Philosophical Society Proceedings.

The English term "watering place" that flourished for many seasons in America and finally gave way to "resort" once had a southern analogue, "retreat". Perhaps this marks an ecclesiastical influence. But in another sense the use of the word was military. For the "retreat" often was fled to as a refuge from the yellow fever of the lowlands. An early geological report of Tennessee gives several pages to describing the cool airs, the abundant brooks and freedom from disease of mountain "retreats" of that state. A lingering establishment of the kind, sprawling over a mountain top and nearly collapsing from decay, sheltered me once while typhoid ran its course, and though it could have served as a symbol of poverty it was steadfast to a tradition of hospitality and kindness. In such a place in the old days, there was naturally a great amount of leisure. Guests strolled around, and strolling they saw snail shells, maybe for the first time in their lives. The shells, by ones and twos and little packets, reached describing naturalists and became blessed binomially, some less deservingly so than others.

A northern "watering place" was Yellow Springs, Ohio. A spring gushes here from a hillside in sufficient quantity to make a good-sized stream. The place was popular with people of Cincinnati, and thither went Thomas G. Lea, brother of Isaac, who had promised he "would look after the shells of his vicinity" when he moved west. He did it so well at Yellow Springs that he sent back lots in which Isaac found two forms he announced as new. Also, Thomas roamed afield and in Buck Creek, fifteen or so miles from

the springs, he took the clam we know now as *Anodontoides ferussacianus buchanensis* Lea. A footnote on Buck Creek is in Ortmann's "Monograph of the Naiades of Pennsylvania", reading, "Location unknown. Possibly near Cincinnati?" The location is given correctly on the cover of Number 8 of Conrad's "Monography of the Family Unionidae", and it seems likely that in Ortmann's copy of this work the covers had been discarded.

All sorts of possibilities develop out of the attempt to follow the course of Conrad in his journey to Claiborne and back. His intention to go south was announced upon the cover of Number 2 of Volume I of "Fossil Shells of the Tertiary Formations of North America", bearing date of December, 1832. The "New Fresh Water Shells of the United States", introduction and text, provides hazy clues to the route and the excursions in Alabama. There is further light among the descriptions in the monograph on the Unios. Other information I owe to Mr. T. H. Aldrich and to various volumes of history.

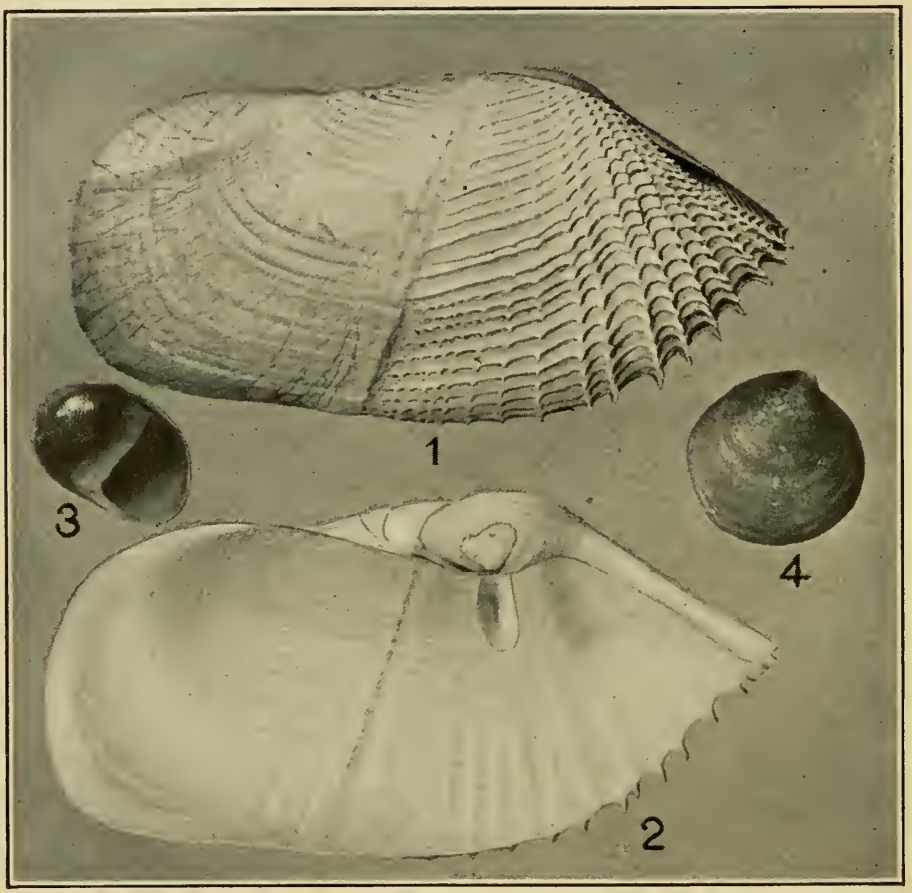
Conrad was on the James River in Virginia in March, 1833. There was then no railroad running south out of Philadelphia and the railroad between Baltimore and Washington was not opened until 1835. When John Quincy Adams went home to Massachusetts in 1825, he travelled by coach to Annapolis, crossed Chesapeake Bay by steamer, by coach again to Newcastle, Delaware, and up the bay and river to Philadelphia by steamer; time twenty-four hours. It is reasonable to suppose that Conrad reversed this journey on his own trip eight years later. After getting to the James River and to Petersburg by stage, it was possible for Conrad to go on to the Roanoke River by rail. Audubon was on this railroad in 1833, and found that passengers could not give much attention to scenery since they had to devote themselves to putting out the sparks the flew upon their clothes from the locomotive. By stage or horseback, Conrad reached Charleston. Here a railroad, in course of building to the Savannah River opposite Augusta, Georgia, could be used for seventy-two miles. This line had the first Ameri-

can constructed locomotive, an engine that exploded because its attendant disliked the sound of escaping steam and tied down the safety valve. Conrad, as he himself sets down, collected around Augusta. Thereafter, he had to use stage or horseback to his destination at Claiborne. He took opportunity to peek into the Oconee, Ocmulgee and Flint rivers of Georgia. The stay in Claiborne was for six months. Excursion was made to Mobile and again to the Tombeckbe River (now Tombigbee) at St. Stephens, an old capital of Alabama that has ceased to exist as a community. He visited Wilcox County, where his host in Monroe County had a plantation. By the evidence of his descriptions, Conrad was on the Black Warrior River in Green County at Erie, a village that either has disappeared or changed its name, for it is not to be found on present-day maps or in gazetteers. How he got there is not mentioned, but thanks are paid to one Dr. Robert Withers of Greene County, probably for hospitality.

Mr. Aldrich has given me Conrad's route home. It was "Claiborne on the Alabama River to Selma by boat. From Selma to Elyton (now Birmingham) by stage. Thence across the upper reaches of the Black Warrior River to Huntsville. I don't know the route from Huntsville, but presume it cut across the eastern part of the state of Tennessee to Bristol; then to Lynchburg, Washington, Baltimore and Philadelphia". About thirty miles north of Elyton was Blount's Springs (since contracted to Blount Springs). He collected near here, apparently staying for a day or two. He took naiades in the Black Warrior by prodding a sharpened stick between their gaping hinges where they lay in six to eight feet of water. Beyond Blount's Springs, Conrad collected in and on the banks of Flint River, reduced now to Flint Creek. In this same district, he assigned to the Tennessee system a tributary stream that belonged to the Black Warrior just as Lea, upon another occasion, gave to the Tennessee system a creek that belonged to the Cumberland. So far, Conrad kept to the main roads. But the "New Fresh Water Shells" shows that he swung

westward as far as Tuscumbia, touching Florence, Muscle Shoals and Elk River. This digression was made easily possible by a new railroad, whose cars were drawn by horse, that joined the navigable water of the Tennessee above the shoals with that below them. It is curious that no hint of this part of the journey is given beyond Elk River "near its junction with the Tennessee". One may guess that the newer stage drivers did not linger at fords long enough to permit Conrad to stuff his pockets with shells.

In 1853, John G. Anthony, then a citizen of Cincinnati, walked through Kentucky, Tennessee and Georgia as far as Macon, "with the double purpose of renovating health, and of collecting the numerous and varied species of fluviatile shells with which our Western streams and rivers abound". Home again, he described fifty melanians, twenty-one of which were placed within the area of his journey. He "regretted his inability to give a more precise statement of habitat" than the names of states because the precautions he "had taken for keeping his collections distinct proved insufficient". Of the twenty-nine other melanians, twenty-two were assigned to Alabama, four to Ohio, one to Ohio doubtfully, one to Indiana and one to locality unknown. Unhappily, such precautions as were taken in which Mr. Anthony put trust were themselves insufficient. Walking, he could not have carried many specimens. Means of carriage for them were doubtless very inconvenient at times. The material just would get mixed. One comes to picturing him as taking up a shell and saying to himself, "Now, where did I get that?" The answer to the question was several times wrong. For example, five species that quite certainly were taken in Kentucky within the Green River drainage were written down as from Tennessee. In one case wherein Anthony broke his rule of keeping locality names confined to states and confidently assigned the species to a Tennessee creek he specified the wrong stream. Nor did confusion halt here. Mr. Anthony got the shells of his travels mixed with those from elsewhere. Three species that were credited to Alabama belonged by rights to Tennessee; one whose loca-



1, 2, Zirfaea pilsbryi Lowe. 3, Neritina reclivata sphaera Pils.
4, Cyrenoida panamensis P. and Z.

tion was given as Indiana appears to have came from Kentucky. Tryon learned that Mr. Anthony's published localities and those of his labels did not always agree, and probably that was why he felt warranted in remarking that one of the Anthony species that was said to be from Alabama was more likely from North Carolina. But this time Anthony was right. The shell was Alabaman. Since Anthony had been in the banking business, which at least has a legend for accuracy, his mistakes may seem the harder to understand. But it must be recalled that the man was in ill health. There is a pathetic note on one of the Anthony labels, now in the Museum of Comparative Zoology: "New species det. while I was blind, by touch alone." It would be pleasant to record that this sense of touch was accurate. Unfortunately, it was not.

Two gentlemen of eastern Georgia were responsible for errors of the kind made by Anthony. Lea received from James Postell of St. Simon's Island mollusks the locality for which was given as Etowah River, one of the two big rivers forming the Coosa. Lea made four species of the lots. Three species were of the Florida "phase" which is quite distinct from that of the Coosa. The fourth seems to have come from Flint River of western Georgia, or one of its tributaries. The Flint fauna, too, is unlike the fauna of the Coosa. James Hamilton Cooper, a friend of Postell's and near enough to him to be called a neighbor, turned the Postell error the other way about. He sent Conrad six melanians as from the Savannah River. They were, in fact, from the upper Coosa River drainage.

TWO NEW HELICOIDS FROM LOS ANGELES COUNTY, CALIFORNIA

BY WENDELL O. GREGG

During the past several months an effort has been made to locate all the non-marine mollusca which have been reported from Los Angeles County, California. This search has

brought to light quite a number of forms which had not been previously reported from this locality. In a number of instances the known ranges have thus been extended many hundreds of miles. Among the unusual finds are the two helicoids which I am describing in the following paragraphs.

HELMINTHOGLYPTA TRASKI PACOIMENSIS, new subspecies. Pl. 4, figs. 5, 6, 7.

Description: Shell helicoid, spire moderately elevated, whorls 5½, convex, slowly increasing, last whorl descending behind the thickened peristome. Base rounded, umbilicus small, permeable to the apex and half covered by the reflected inner lip. Aperture subcircular, oblique; outer lip very slightly expanded, inner lip broadly expanded at the base. Color light golden brown, paler on the base, the shoulder marked with a band of liver brown, bordered above and below by a somewhat narrower band which is lighter in color than the body of the shell. Periostracum somewhat glossy, irregular incremental lines are strongly marked on all whorls; entire surface of shell finely wrinkly-granulose with a strong coarse overlying papillation. This papillation is widely spaced on the body whorl. On the preceeding whorls it is more closely spaced and in unworn specimens each papilla bears a minute stubby hairlike periostracal process. The papillation on the younger whorls is noticeably arranged in both oblique and spiral series. The spiral sculpturing which consists of incised spiral lines is moderately developed on the penultimate whorl and is strongly marked over the entire body whorl.

Measurements: The type specimen measures as follows: Maximum diameter, 20 mm.; minimum diameter, 16.3 mm.; altitude, 13.5 mm.; umbilicus, 1.7 mm. Paratype, max. diam., 20 mm.; min. diam., 16.4 mm.; altitude, 13.5 mm.; umbilicus, 1.7 mm.

Type: No. 1033 Collection of Los Angeles Museum. Paratypes in collection of writer. The type with about 14 specimens (mostly immature) were taken in Pacoima Canyon, San Gabriel Mts., Los Angeles County, Calif., about one-

half mile below prison camp, on Feb. 21, 1931. They were found mostly under bark and fragments of rotten logs.

Remarks: The only other described form of *H. traski* which bears papilla over the body whorl is *H. traski isidroensis* Bartsch. This form may be distinguished from *isidroensis* by its more strongly incised spiral lines over the body whorl and by the presence of coarse papillae distinctly spaced over the entire under surface as well as upper surface of the body whorl.

HELMINTHOGLYPTA FONTIPHILA, new species. Pl. 4, figs. 8, 9, 10.

Description: Shell small, thin, helicoid, moderately flattened, whorls 5, convex, last whorl descending slightly behind the peristome. Base rounded, umbilicus rather large, patulous, about one-seventh the greater diameter of the shell. Aperture subcircular; peristome thin and not expanded. Color, dark olive-buff, marked on the shoulder of the whorl by a narrow chestnut-brown band which is bordered on either side by a somewhat narrower band, lighter in color than the body of the shell.

First two and a half or three whorls finely granulose while the entire remainder of the shell is covered by numerous fine papillae overlying a finely wrinkly-granulose groundwork. These papillae generally appear to be arranged in oblique series and on unworn specimens each papilla bears a minute hairlike periostracal process giving the shell a finely hirsute appearance.

Measurements: The type specimen measures as follows: Maximum diameter, 15.7 mm.; minimum diameter, 13.5 mm.; altitude, 8.7 mm.; umbilicus, 2.3 mm. Measurements of largest paratype: Maximum diameter, 16.7 mm.; minimum diameter, 14 mm.; altitude, 8.8 mm.; umbilicus, 2.5 mm.

Type: No. 1032 Collection of Los Angeles Museum. Paratypes in collections of writer, E. P. Chace, G. W. Willett and S. S. Berry.

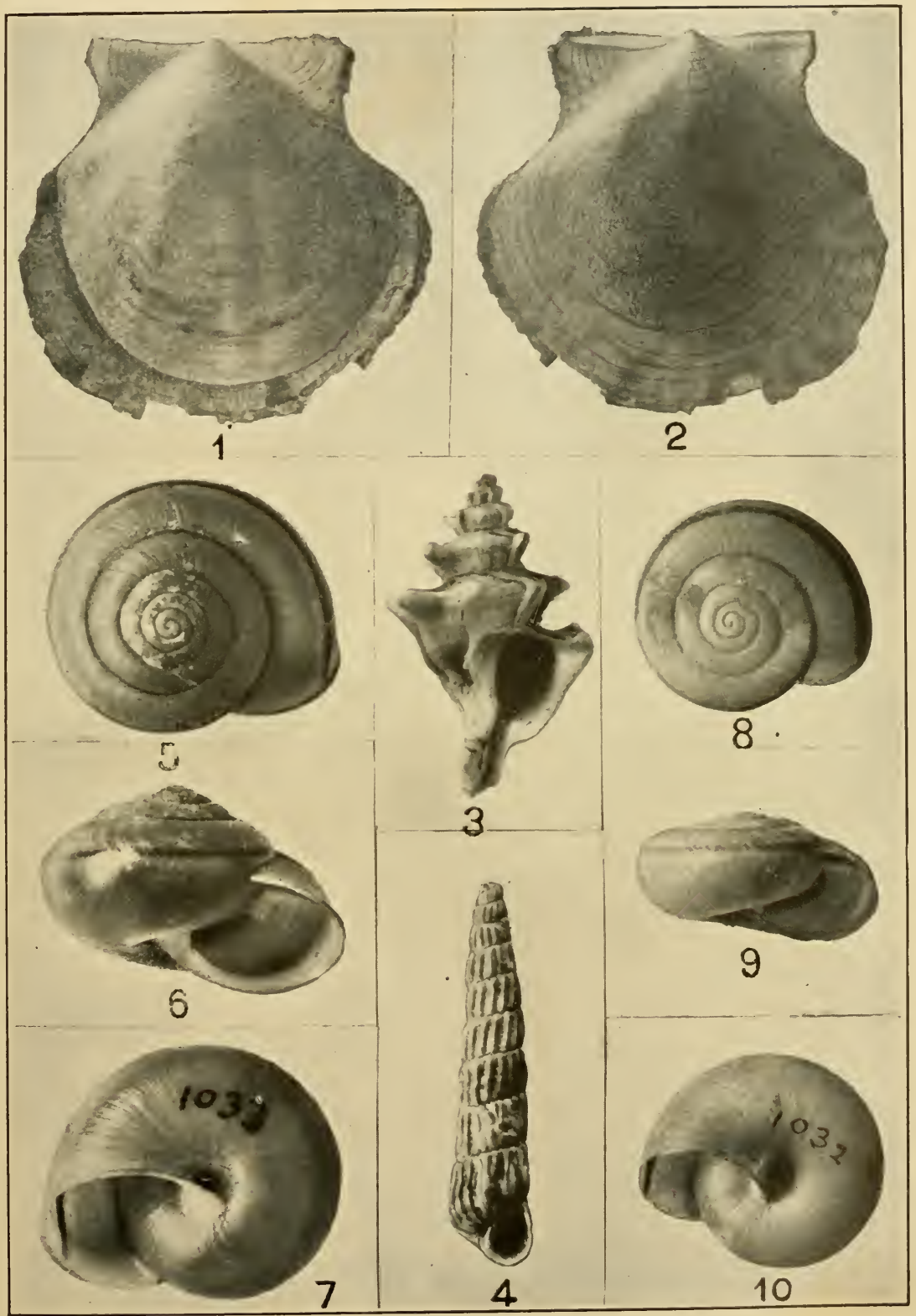
Type Locality: This odd race of *Helminthoglypta* was first

discovered on March 26, 1931, in a rather restricted area around a spring, west side of road, about one-half mile below dam, Little Rock Creek Canyon, north side of San Gabriel Mts., Los Angeles County, Calif. On May 10, 1931, the writer revisited the locality with Mr. and Mrs. E. P. Chace, at which time about 50 additional specimens were taken. Much of the material however consisted of dead or immature specimens. At this time a number of specimens were taken directly across the canyon below a leaking flume under leaves and rocks which were constantly moistened with cold water.

Additional Localities: Quite a number of specimens have been taken at various localities in Soledad Canyon, Los Angeles County, ranging from 5.5 to 8.5 miles from the Mint Canyon Highway (Solemint Service Station). This area might be roughly termed as the western half of the canyon proper. They were found in each locality near the Soledad Canyon Road, under rotten logs and in piles of brush. Each locality was but a few feet from the Santa Clara Creek.

This shell bears a close relationship to the Mohavean group of *Helminthoglypta*. It is the first of that general group to be taken within the limits of Los Angeles County. It is the only one of that group which apparently is found only near streams or springs. It may be distinguished from *H. mohaveana* by the following differences: It is smaller, thinner, flatter, more highly colored and the papillae are finer and bear hairlike processes. It may be distinguished from *H. cuyamacensis venturensis* Bartsch by its much thinner shell, smaller size, more flattened form, thin inner lip which is not expanded, larger and more open umbilicus which is not covered in any portion by the inner lip. The paratype of *venturensis* which I have before me is considerably lighter in color but that characteristic may be due to fading.

The figures accompanying this description are from photographs made at the Los Angeles Museum. I am indebted to Dr. Alex. Wetmore, Asst. Secretary of the U. S. National Museum, for the loan of the paratype of *H. cuyam-*



1, 2, Pecten catalinensis Willett. 3, Trophon albospinosus Willett 4, Turbonilla strongi Willett. 5—7, Helminthoglypta traski pacoimensis Gregg. 8—10, Helminthoglypta fontiphila Gregg.

acensis venturensis. I am also indebted to Mr. George W. Willett of the Los Angeles Museum, whose splendid collection of Southern California helicoids has made possible a careful comparison with all the species which are common to the desert region, and through whose efforts the loan of the paratype of *H. venturensis* was secured.

WHAT IS ROPERIA ROPERI DALL? WITH NOTES ON TURRIDAE AND COLUMBELLIDAE

BY HERBERT N. LOWE

While at the National Museum July 22, 1931, checking up identifications on some of my recently collected west American material, I took the opportunity to make a critical examination of the unique type of the shell Dr. Dall described as *Fusus roperi,* new subgenus *Roperia.* The shell has long been a puzzle to West Coast collectors, and has never been taken since except for one other specimen thus marked in the collection and plainly showing teeth on the outer lip. I found a set of immature and rather worn specimens of *Tritonalia poulsoni* in the collection and without telling what they were looking at, had them compared by Mr. Wm. B. Marshall, Dr. Ralph B. Stewart and Dr. W. P. Woodring, and the unanimous decision was that they were one and the same shell without the slightest doubt. The second specimen labeled *Fusus roperi* has the mature lip with strong teeth as in *Tritonalia poulsoni.*

It seems that *Roperia roperi* Dall will have to be entirely dropped from the list and placed in the synonomy of *Tritonalia poulsoni*

In Philadelphia, while comparing our Turridae with the types of C. B. Adams' species and checking up with Dall's paper on the family (Proc. U. S. N. M., Vol. 56), we found *Zetekia denticulata* described on page 73, fig. 1, pl. 1, is the identical species described by C. B. Adams in the Panama Catalogue No. 173, as *Pleurotoma gemmulosa,* both from Panama.

The species described as *Crassispira dirce* Dall, page 22, pl. 6, fig. 3, is the same species as *Pleurotoma grandimaculata* C. B. A. No. 174, Panama Catalogue.

On page 25, vol. 30, of THE NAUTILUS, in an article on west American Columbellidae Dr. Dall made the statement that *C. terpsichore* Sby., 1822, equals *C. lyrata* Sby., 1832. This error evidently came from two lots in the national collection both from Panama, one labeled *C. terpsichore* and the other *C. lyrata*, both being the same species. The name *Col. lyrata* Sby. should stand for the Panamic form as it was described from Panama by Sowerby, P. Z. S., 1832, p. 114, while *C. terpsichore* Sby. was described from Nevis, West Indies, Sowerby, Genera of Shells, fig. 6. The two forms are quite distinct, and the true *C. terpsichore* seems never to have been reported from the Panamic region.

NOTE ON THE WEST COAST ZIRFAEA

BY HERBERT N. LOWE

While going over the collections of the Academy of Natural Sciences of Philadelphia, May-July, 1931, I had the opportunity of examining the type specimen of *Zirphaea gabbi* Tryon. This name Dr. Dall has used for our West Coast form for some years; it was earlier known as *Z. crispata*. Tryon's species was described from a very dead and somewhat damaged valve sent by Gabb from San Francisco, and said to be probably from Japan. The illustration (Proc. Acad. Nat. Sci. Phila., 1863, Monography of the order Pholadacea, pl. 1, fig. 1) is a very accurate representation of the shell in question, and is not our common Californian species at all. On making a careful comparison of the type specimen with large examples of *Pholadidea penita* var. *concamerata* Desh. from Monterey we find that without a doubt they are one and the same species. Thus the name *Zirphaea gabbi* Tryon will have to be placed in the synonomy of *Pholadidea penita*

var. *concamerata* Desh., and our California species of *Zirfaea* is left without a name. I propose for it the new name *Zirfaea pilsbryi.*

ZIRFAEA PILSBRYI, new species. Pl. 3, figs. 1, 2.

Type 50809 A. N. S. P., from Bolinas, California (Henry Hemphill). Paratypes in Lowe collection.

Shell large, transverse, obliquely divided by a shallow furrow proceeding from the umbonal apex to the basal margin and forming a corresponding rib on the internal surface of valve. Posterior to the furrow the shell is marked only by growth wrinkles; on the anterior half they appear as sharp ribs which are produced into sharp spines in unevenly spaced radiating lines continuing to the sharply crenulated margin. Diameter of type, 36 mm.; alt., 37 mm.; length, 75.5 mm.

Our shell differs from the typical North Atlantic *Z. crispata* (Linn.) in being a longer and narrower shell, with the apophysis, or internal spoon-shaped process, much broader and much more concave. The anterior end of our shell is more markedly attenuated, the dividing furrow more oblique and not so prominent as in *Z. crispata* (L.)

In the north it reaches a large size, up to 120 mm. long (Newport, Oregon, coll. by J. G. Malone). Mr. Malone reports that they are eaten. A large one sent to the Academy, Philadelphia, weighed 17 ounces shell and all.

ON THE NAME MITRA LINEATA

BY J. R. LE BROCTON TOMLIN

There are no less than five uses of this combination to be considered:

(a) *Mitra lineata* Schumacher, Ess. Nouv. Syst., p. 239, 1817. According to Dautzenberg and Bavay in Journ. de Conch. 67, pp. 150, 153, this shell was a *Varicella;* but Schumacher only says that his *Mitra* "a la forme à peu près de"

Chemnitz's figures 1372, 1373 (he meant 1371, 1372) in vol. IV, which represent the well-known *Varicella leucozonias* (Gmelin). Schumacher goes on to say how his species differs from that of Chemnitz, and evidently mentioned these figures chiefly on account of the color, *M. lineata* being described as "d'une couleur brune avec des lignes blanches longitudinales, très serrées". Küster described and figured a *Mitra* from the Gotha Museum which agrees well with Schumacher's account. In any case, from all the evidence obtainable, *lineata* Schum. seems to be a synonym of *paupercula* L. It is incredible that so good a conchologist as Schumacher would group a *Varicella* with five genuine species of *Mitra,* to form his half-dozen examples of the genus.

(b) *Mitra lineata* Hoeninghaus, Neues Jahrb., 1831, p. 152, for a tertiary fossil from Dax. This is a *nomen nudum.*

(c) *Mitra lineata* Isaac Lea, Contrib. Geol., p. 168, pl. V, fig. 174, 1833, for a Claiborne fossil. De Gregorio in Ann. Géol. Paléont., livr. 7, p. 73, Jan., 1890, describes a var. *terplicata,* possessing only three columellar folds while Lea's type has four. He had not seen the quadriplicate form. In Lea's type the anterior fold forms the inner outline of the columella continuing downward and would very probably not be counted as a fold by Gregorio. It is, therefore, at present doubtful whether the two authors really had different shells before them, and it seems best to let *Mitra terplicata* Greg. stand for *M. lineata* Lea, at any rate for the present.

(d) *Tiara lineata* Broderip (ex Swainson MS.), P. Z. S. London, 1835, p. 195, 8/4/1836, for a *Mitra* from Salango, W. Colombia, dredged by Cuming. It is well figured in Reeve's Conch. Icon. II, pl. xvii, fig. 127. This species may be renamed MITRA ERYTHROGRAMMA. It is recorded in Journ. of Conch. XVIII, p. 158, from Gorgona Island, and from James Island, Galapagos.

(e) *Mitra lineata* Swainson, Treatise Malac., p. 319, 1840. This is based on a figure in the Encycl. Méthod. and is the same species as *tigrina* A. Adams.

Some authors have taken Gmelin's *Voluta lineata*, Syst. Nat. ed. xiii, p. 3454, to be a *Mitra*. The figures referred to in Martini, however, more probably represent the common Mediterranean *Pollia d'orbignyi* (Payr.). The type is unfortunately no longer to be found in Spengler's collection at Copenhagen.

Swainson's *Conoelix lineatus*, Zool. Illustr., ser. 1, vol. 1, pl. 24, Jan., 1821, is probably a discolored *M. conica* Schum., according to Reeve.

I am indebted to Dr. Pilsbry for advice on species (a) and (c).

MONOCONDYLAEA COSTULATA MORICAND

WILLIAM B. MARSHALL

Dr. F. Haas in "Senckenbergiana", vol. 13, No. 1, page 48, figs. 31a and 31 b, 1931, has discussed the type and another specimen of *Unio* (*Monocondylaea*) *costulata* Moricand, 1858.[1] His figures of the type are excellent, and he has sent to the United States National Museum copies of the still more excellent original photographs from which these figures were made. This type is deserving of even closer study than has been given to it, for while both Moricand and Haas place it in *Monocondylaea*, it has some features which seem to make it impossible that this can be the correct genus. If it be the correct genus, the species is certainly an aberrant one.

As Haas points out, Moricand's figure over-emphasizes the depression running from the beaks to the ventral margin, and also has the ribs entirely out of proportion. In fact Moricand's figure might be said to be more or less diagrammatic, indicating that he was satisfied to transmit to his readers a general impression without being too exact. In his description of this species, Moricand says, "epi-

[1] 1858. Revue et Magasin de Zoologie, p. 453, plate 15, figures 1 and 1a.

dermide . . . olivaceo, unicolare". If the species be true *Monocondylaea* the color should not be uniform, as *Monocondylaea* should always have one or more green rays on the posterior area much darker than the surrounding portion of the shell. It may be that wishing to transmit only a general impression, Moricand did not think this feature worth mentioning, if, in fact, it does exist in the type. The National Museum contains a specimen of the very next species described by Moricand as *Monocondylaea reticulata,* which is in our records as having been received by Isaac Lea indirectly from the author through Mr. W. A. Haines. In his description of this species, Moricand says: "Epidermide olivacea, unicolare, reticulato". Our specimen contains a distinct green line on the posterior area, while near the beaks there are several of these radiating green lines. The green on this area is as it should be in this genus.

In describing *costulata* Moricand says: "Epidermide crasso". In French he adds, "peu adhérent". Probably an examination of the type would show that the reason he was impressed by an apparent unusual thickness of the periostracum was because he unwittingly was dealing with the periostracum and the prismatic layer combined. Haas' figures show distinctly that the periostracum of the type of *costulata* is given to splitting and peeling. In the many specimens of *Monocondylaea* that I have handled, there has never been one that had a peeling periostracum. All the species of the genus and, in fact, practically all species of South American Mutelidae (as defined by Simpson, not Ortmann) except a few of the very large ones such as *Leila blainvilleana,* are formed on what I might call a "hug-me-tight" principle; that is, the prismatic layer is thick and even after long drying in the dry atmosphere of a museum it clings to the nacreous layer beneath it. It has been my experience that any species of naiad which has a peeling periostracum has a thin prismatic structure, and when there is any peeling, both the periostracum and the prismatic layer come off together. Even in some of our North American gigantic naiads such as *Megalonaias gigantea* Bar.

(*Quadrula heros* Say), which are prone to peel, the prismatic layer is a mere film. When peeling occurs it makes the flakes of "periostracum" appear to be very thick. This peeling periostracum throws another element of doubt into the position of this species in *Monocondylaea.*

Radiating ribs should not occur in *Monocondylaea.* According to Haas, the prominent radiating ribs on *M. costulata* do not show in the calcareous structure underneath. The sculpture of the periostracum should show in the prismatic layer, but except when the external sculpture is bold, such as spines or convolutions or ridges, it does not usually show in the nacreous structure, and that is probably the explanation of the absence of these ribs in the exposed calcareous portion of Moricand's type. An examination of the peeling portion of the shell will probably show that the prismatic layer has come away from the nacreous layer with the periostracum. If hot caustic potash solution be applied to a small portion of one of the ribs, to remove the periostracum without effecting the prismatic portion, the ribs which show so plainly in the periostracum should, according to all rules, show in the prismatic layer, and this layer should show also the beautiful arrangement of the ends of the hexagonal prisms which constitute it. Periostracal and (or) prismatic layers are the elements in external sculpture. Nacreous layer is to be regarded as a filling, smoothing and stiffening material, which forms in varying quantities as needed for different parts of the interior and which, when broken, can usually be roughly repaired with the same material. Doctor Haas is right when he says that the rib-like radiations of the interior between the pallial line and the ventral margin has nothing whatever to do with the external ribbing. This is a feature belonging entirely to the nacreous layer only.

The cardinal area of *costulata* is not what it should be in typical *Monocondylaea.* Typically, the tooth of the left valve should hook around in front of the tooth in the right valve, and there should be no distinct socket for the former to sink into in the latter.

Some may think that too much value has been given to surface characters. Probably many of us, before we had gained much experience in malacology, have had some difficulty in distinguishing between imperfect specimens of *Lymnaea* (*Pseudosuccinea*) *columella* and *Succinea*. Later we learned that *columella* has the periostracum beautifully, minutely, spirally striate, and that this does not occur in *Succinea*. When the periostracum is removed the striation still shows plainly in the calcareous portion. This single instance is sufficient to show that minute details are of considerable importance.

Readers of THE NAUTILUS may find it worth while to examine specimens of *Monocondylaea* in their collections to see whether any of them have a peeling periostracum, taking care, of course, not to mistake erosion for peeling. We shall be glad to hear of any such specimens.

U. S. National Museum.

THE GASTROPOD FAMILY PLEUROCERIDAE IN PENNSYLVANIA

BY STANLEY T. BROOKS, PH.D.

Due to the great number of papers on this subject by A. E. Ortmann, Bryant Walker, F. C. Baker, and Calvin Goodrich, the author does not deem it necessary to go into the complicated explanation of all of the geographical factors involved. Mention will be made of the various routes of migration with the understanding that all students of this field of work will have undoubtedly referred to the other more comprehensive publications.

This paper, therefore, will outline the distribution of the Family *Pleuroceridae* in this state and will but mention the extent of the migration into the northeastern states. This Commonwealth is again the Keystone State in that all of the species of this family, in the region indicated, have been

distributed by the watersheds of Pennsylvania or by related or adjoining bodies of water.

In distributional work we do not have a great body of experimental facts upon which to base our theories. It is necessary, then, to study the conditions and facts of present distribution and to apply to these facts the most logical assumptions and theories of the geologist and geographer. It is with this view in mind that the author writes the following paragraphs in the hope that further accumulation of knowledge will help to elucidate some of the present haziness.

1. *Goniobasis virginica* (Gmelin).

During the preglacial uplift of the eastern part of the United States and the subsequent formation of the present drainages the rivers flowing to the Atlantic emptied some miles farther out to sea than at the present time. The river of interest in the distribution of this species was the Chesapeake River and included in its great flow the present Delaware, Susquehanna, Potomac, James and Roanoake Rivers. This confluence of freshwater made it possible for *G. virginica* to make its way into the drainages of the above rivers (being derived from the south).[1] The fact that the glaciation of the Pleistocene Period did not extend over the entire drainage of all of these streams may explain their apparent retention of this species (or the one from which it was derived) through the turbulent period of the ice.

The presence of this species in the Connecticut River (Deep River, Conn., and Agawam, Mass.) cannot be explained in this manner unless there was a period of fresh water communication between the New York Sound and the

[1] The identification of *G. symmetrica* as the ancestral form of *G. virginica* is doubtful. However, *G. virginica* does point to a south coast origin (Ortmann, A. E., "The Alleghenian Divide and Its Influence upon the Fresh Water Fauna," Proc. Amer. Philos. Soc., LII, 1913, 287-390) and has only advanced into its most northerly localities following the path of some of the Naiades. This point will undoubtedly be elucidated by further collecting and study of the south coast drainage and its relative (in case of stream capture) western drainages.

Delaware Embayment or that during this time the waters near the coast were fresh or only slightly brackish from the drainage of the glaciated regions thus enabling *G. virginica* to live through this period under fairly normal conditions.

According to an opinion advanced by Dr. A. E. Ortmann and Dr. Bryant Walker the presence of various naiades on the eastern slope is due to a distribution from the Mississippi Valley through the St. Lawrence Embayment by means of the preglacial Erigan River. From this source a general migration down the east coast took place. The distribution of *G. virginica* will have to rest between these two theories until either their southern affinities or their western affinities finally give up the secret.

Localities in the Carnegie Museum Collection.

Wissahickon Creek, Roxboro, Philadelphia Co.; Delaware River, Yardley, Common Creek, Tullytown, Delaware River, Penns Manor, Bucks Co.; Lehigh River, Bethlehem, Northampton Co.; Susquehanna River, Selinsgrove, Penns Creek, Selinsgrove, Snyder Co.; West Branch Susquehanna River, Williamsport, Lycoming Co.; North Branch Susquehanna River, Tunkhannock, Wyoming Co.; Chemung River, South Waverly, Bradford Co.; Frankstown Branch Juniata River, Hollidaysburgh, Blair Co.; Codorus Creek, York, Conewago Creek, York, York Co.; Condoquinet Creek, Carlisle, Cumberland Co.; Raystown Branch Juniata River, Ardenheim, Frankstown Branch Juniata River, Alexandria, Huntingson Co.

2. *Anculosa carinata* Brugière.

3. *Anculosa dilatata* Conrad.

The two species of this genus, in Pennsylvania, are so closely linked in their distribution and past history that it is much better to discuss them together. *Anculosa carinata* has the widest distribution (Susquehanna Drainage and tributaries of the Potomac River) of the two species. It is indicated by Ortmann (l.c.), and his profiles of the various streams of the Alleghenian Divide that there has been much stream capture by the James, Roanoake and Potomac Rivers of the headwaters of the western streams, the Cheat, New and Greenbriar Rivers. This would afford a passage for the

Mississippi Valley fauna to the eastern drainage and indicates a probable means of the origin of *carinata*. It is still doubtful, according to Goodrich, just what the relationships of *carinata to dilatata* are but from the record of the drainages it seems probable that *carinata* has been derived from the Mississippi Valley fauna. The absolute history of this species will remain for future studies. The great variation in the two species and the obvious mixture of specific characteristics in some of the mountain streams of West Virginia gives credence to this theory. In Pennsylvania the Monongahela River alone has *A. dilatata* (captured from New River) and this distribution is confined to the upper-small-stream-reaches of this river in Fayette County. The Susquehanna River has obtained *A. carinata* from the Potomac Drainage by stream capture in the southern part of the state. The absence of this genus from the Delaware River does not preclude any possibility of a distribution from the sea-ward side of the Alleghenies along with *G. virginica*. Its absence does indicate that *carinata* arrived into this drainage (Susquehanna) after the fresh waters of the old Chesapeake River were covered by the sea. Hence a later distribution.

Localities in the Carnegie Museum Collection.

OHIO (MONONGAHELA) DRAINAGE

Anculosa dilatata

Cheat River, Cheat Haven, Fayette Co.

POTOMAC DRAINAGE

Anculosa carinata

Wills Creek, Hyndman, Bedford Co.; Great Tonoloway Creek, Fulton Co.; Conococheague Creek, Green Castle and Scotland, West Branch Conococheague Creek, Mercersburgh Junction, West Branch Little Antietam Creek, Waynesboro, Franklin Co.

SUSQUEHANNA DRAINAGE

Anculosa carinata

Conewago Creek, Table Rock and York Haven, York Co.; Condoquinet Creek, Carlisle, Cumberland Co.; Lost Creek,

Mifflintown, Juniata Co.; Frankstown Branch Juniata River, Huntingdon Co.; Raystown Branch Juniata River, Bedford and Mt. Dallas, Bedford Co.; Penns Creek, Selinsgrove, and Susquehanna River, Selinsgrove, Snyder Co.; North Branch Susquehanna River, Tunkhannock, Wyoming Co.; Chemung River, South Waverly, Bradford Co.; Raystown Branch Juniata River, Ardenheim, Huntingdon Co.

4. *Lithasia obovata pennsylvanica* (Pilsbry)

This species, formerly identified and described as a *Goniobasis,* is, according to Calvin Goodrich, a *Lithasia.*

L. obovata pennsylvanica forms the greater part of the Pleurocerid fauna of the Beaver Drainage and is associated with *Pleurocera canaliculatum* in the Allegheny River. It, the former, is a common species of the Falls of the Ohio and has, like *canaliculatum,* migrated into the Ohio River at the retreat of the Ice and the subsequent formation of a suitable habitat in the new drainage.

Localities in the Carnegie Museum Collection.

BEAVER DRAINAGE

Little Beaver Creek, Smiths Ferry, Cannelton, Darlington, New Galilee and Enon Valley, Beaver Co.; Beaver River, Wampum, Slippery Rock Creek, Wurtemburg, Mahoning River, Mahoningtown, Edinburg, Hillsville and Neshannock Creek, Eastbrook, Lawrence Co.; Neshannock Creek, Leesburg, Otter Creek, Mercer, Shenango River, Sharpsville, Pymatuning Creek, Pymatuning Twp., Shenango River, Shenango, and Little Shenango River, Greenville, Mercer Co.

OHIO (ALLEGHENY) DRAINAGE

Back River, Ohio River, Neville Island, Allegheny Co.; Allegheny River, Alladin, Kelly and Parkers Landing, Armstrong Co.; Allegheny River, Woodhill and Walnut Bend, Venango Co.; Allegheny River, Hickory, Forest Co.; Allegheny River, Warren, Warren Co.; French Creek, Cochranton and Meadville, Crawford Co.

5. *Pleurocera canaliculatum* (Say)

6. *Pleurocera acuta* (Rafinesque)

P. acuta and *P. canaliculatum* are both of the Ohio Drainage and are more easily discussed together. Whether *acuta* developed from *canaliculatum* or not is a question. They

are related forms and merge, one into the other, at various points where their territory overlaps.

After the maximum glaciation of North America and during the recession of the ice lobes there was developed the Ohio and the Great Lakes Drainages. During or after this formative period when the drainage was to the south *acuta* made its way into the Great Lakes System. There it has developed into the typically attenuated form as we know it today.

At the same time the *canaliculatum* stock was migrating into the Ohio and has penetrated to the headwaters of the Allegheny River. In the Monongahela River there has been only one station found of this species; the rest of the river being barren. At the Falls of the Ohio we have a short, robust form of *canaliculatum* and as we progress up the Ohio and into the Allegheny there is a gradual elongation of the shell. This elongation reaches its peak in the upper reaches of the Allegheny. If these upper Allegheny forms are laid side by side with *acuta* from Lake Erie one cannot see where the one species ends and the other begins. The reason for this elongation, we may say, is an accumulative ecological reaction between the species and its environment. Accumulative because the species seems to react to its environment to a greater extent as they progress northward in their migration. This is an obvious reason but will have to suffice until studies have been made to determine the ecological forces, the reactions of this species to its environment or forces, and the relative heritability of these environmental effects.

Localities in the Carnegie Museum Collection.

LAKE ERIE

Pleurocera acuta

Lake Erie, Erie Co.

OHIO DRAINAGE

Pleurocera canaliculatum

Allegheny River, Godfrey, Armstrong Co., Walnut Bend, Venango Co., Hickory, Forest Co., Warren, Warren Co.;

LIBRARY

Ohio River, McKees Rocks and Neville Island, Allegheny Co., Industry and Smiths Ferry, Beaver Co.; Youghiogheny River, Boston, Allegheny Co.

7. *Goniobasis livescens* (Menk)

This species is the common lake form of the Great Lakes and extends in its distribution through the Finger Lakes and into the St. Lawrence River. Surprising as it seems it is also an inhabitant of the upper parts of the Allegheny Drainage and in the Beaver Drainage. It also occurs farther west in some of the streams of Ohio. In the Allegheny Drainage it is found only in Conneaut Lake, Conneaut Outlet, and French Creek. The evidence here is that it gained this distribution from the old Ohio-Lake Erie Canal of which Conneaut Lake was a "feeder". It has been a late origin or otherwise this species would have been found farther south in French Creek. The only explanation for the greater distribution in the Beaver River is the same; the Lake Erie-Ohio Canal. Further collections to the west may explain the presence of this species in this region to a better advantage.

Localities in the Carnegie Museum Collection.

LAKE ERIE

Lake Erie, Erie, Erie Co.

BEAVER DRAINAGE

Little Beaver Creek, New Galilee, Darlington and Cannelton, Beaver Co.; Little Beaver Creek, Enon Valley and Beaver River, Wampum, Lawrence Co.; Shenango River, Shenango, Mercer Co.

OHIO DRAINAGE

Ohio River, Smiths Ferry, Beaver Co.; French Creek, Meadville, Cochranton, Conneaut Lake, Conneaut and Conneaut Outlet, Conneaut, Crawford Co.

8. *Goniobasis haldemani* Tryon

This is a doubtful form and has been very sparsely collected in Lake Erie in Pennsylvania. Just what its history and relationships to the other members of this genus is, is not known.

THREE NEW MARINE MOLLUSKS FROM CATALINA ISLAND, CALIFORNIA

BY G. WILLETT

PECTEN (CYCLOPECTEN) CATALINENSIS, sp. nov. Pl. 4, figs. 1, 2.

Description: Shell small, shining, transparent, very fragile; right valve white, unmarked; left valve with about twenty, somewhat irregular, brown, radial rays, running from the median part of the disk to the margin; these rays show through the transparent shell so plainly that, to a casual inspection, the right valve appears rayed also. Ventral margin of left valve convex; that of right valve flexible and reflexed when closed. Sculpture of left valve consisting of fine growth lines, crossed, in the umbonal region by very fine, wavy striae, visible only under a strong lens. Ventral two-thirds of right valve marked by fine, closely spaced, incised, concentric lines, with wider interspaces; similar lines also apparent on the anterior auricle above the rather shallow byssal notch. Ears in both valves nearly equal in size. On the left valve the ridges running from the sides of the shell to the umbo, and dividing the discal from the auricular regions, are so sharply defined as to be almost carinate: these ridges, meeting at the umbo, form the two sides of a perfect triangle.

The type, No. 1020 Collection Los Angeles Museum, and another smaller specimen, were taken by the writer in 100 fathoms off White's Landing, north side of Catalina Island, California, July, 1928. The type measures in millimeters: height, 7; breadth, 7.5; hinge line, 5; diameter, 1.6.

Remarks: This little pecten appears nearer to *Pecten cocosensis* Dall than to any other species known to the writer. It differs strongly from that species, however, in more nearly equal ears, lack of spines on the hinge-line, and entirely different color markings.

TROPHON (BOREOTROPHON) ALBOSPINOSUS, sp. nov. Pl. 4, fig. 3.

Description: Similar to *Trophon triangulatus* Cpr. (Cal. Acad. Sci., 3, 1864, p. 224), not of Dall (Bull. 112, U. S. N. M., 1921, p. 109), but larger, with proportionately greater diameter, longer spines, and different color. In color, similar to *T. macouni* Dall (Can. Dept. of Mines, G. S. Branch, Mem. No. 14-N, p. 12, pl. 1, fig. 7), but very different in shape from this species, being much wider proportionately, with shorter canal, more acute angles and longer spines, and lacking the prominent spiral cords of *macouni*.

The type, No. 1028 Collection of Los Angeles Museum, has six whorls, the apex being lost. The first two of these whorls are roundly rectangular at the shoulder, the last four very acutely angulated. Varices eight, sharply laminated, forming open, somewhat curved spines at the shoulder. The shoulder keel, between the spines is a poorly defined spiral cord. The type shows no other spirals, but two smaller specimens in the writer's collection have an indication of another cord on the body whorl, about one-third of the distance from the shoulder to the anterior extremity of the shell. Outer lip thin; canal short and open. Color of shell dark brownish purple; spines white; interior of aperture brown. The type, the largest specimen seen, measures as follows, in millimeters. Length, 21; diam. 14.4; last whorl 12.

The type and nine other specimens were taken by the writer in about thirty fathoms, off White's Landing, north side of Catalina Island, California. In the same locality a dozen or more specimens of *T. triangulatus* were secured, all of which were bluish-white in color.

Trophon triangulatus Cpr. also belongs in the subgenus *Boreotrophon*, as used at present, and not in *Austrotrophon*, where it is placed by Oldroyd (Marine Shells of W. Coast of N. A., 1927, Vol. 2, part 2, p. 28).

TURBONILLA (PYRGOLAMPROS) STRONGI, sp. nov. Pl. 4, fig. 4.

Description: Shell very slender: chocolate brown (nuclear whorls decollated). Post-nuclear whorls almost straight along the sides, only very slightly rounded toward the shouldered summit and the periphery, marked by strong, rounded, slightly protractive axial ribs, of which there are 18 on the first and second, 16 on the third to sixth, 18 on the seventh, 20 on the eighth and ninth, and 24 on the tenth (last) turn. Intercostal spaces two or three times as wide as the ribs. Periphery of the last whorl obtusely angulated, marked by the continuations of the axial ribs, which remain strong to the columellar region.

The type, No. 1019 Collection of Los Angeles Museum, has ten post-nuclear whorls, and measures: Length, 6.8 mm.; diam., 1.6 mm. It was taken by the writer in 25 fathoms off the north shore of Catalina Island, California, July, 1920. A smaller specimen taken at the same time is in the writer's collection.

Remarks: This species is proportionally the most slender of our known west American *Pyrgolampros*. In dimensions it more nearly resembles some of the slender species of the sub-genus *Turbonilla*. It is probably as close to *T. halibrecta* Dall and Bartsch as to any member of its sub-genus. From this species it differs markedly in more slender proportions, different number of axials and their much stronger continuation on the base.

I take pleasure in naming this species for Mr. A. M. Strong, the well-known student of west coast mollusca, and my companion on several dredging expeditions.

Los Angeles Museum, Los Angeles, California.

A NEW RACE OF NERITINA RECLIVATA SAY

BY H. A. PILSBRY

NERITINA RECLIVATA SPHAERA, new subsp. Pl. 3, fig. 3.

The shell is less elevated than *N. reclivata,* the spire *extremely short,* rising very little, the last whorl *strongly con-*

vex above the periphery, not flattened and sloping as in *reclivata.* Color grape green, densely marked with fine black lines and with a black line following the suture, as in *reclivata.*

Length, 15 mm.; diam., 16 mm.; length of aperture, 14 mm.; 4 whorls.

Ojus, Florida. Type and paratypes No. 154935 A.N.S.P., collected by Mr. Roger P. Gray.

This snail was brought in by Mr. Innes, with specimens of *N. virginea,* which had been sent by Mr. Roger P. Gray of the Roger P. Gray Fish Hatcheries, Ojus, Florida. On application to Mr. Gray he kindly sent numerous specimens, with the following notes. "They are found in one of the drainage canals draining Lake Okechobee, a few miles from the Atlantic. They usually occur on giant Vallisneria and reeds, mostly in shallow water, but I have never found them in the mud or among rocks. The water is not very clear, yet I feel that it is clean. It is not salty. They seem to eat all algae. I put quite a number of them in a Mollienesia pool which I have, which was practically full of algae, in strictly fresh water, and they have eaten up all the algae. They live nicely in fresh water."

In many hundreds of *N. reclivata* from many localities there are none having the globose shape, short spire and relatively large aperture of these shells. The apices of all the specimens are perfect, so that the full height of the spire is seen.

N. reclivata Say has been subordinated to *N. lineolata* Lam. by Prof. von Martens. The figures referred to in Encycl. Méth. certainly do not resemble the Florida shells. I prefer to use the well established name. *Cf.* H. Burrington Baker, P.A.N.S. 1923: 141.

Dr. Baker has made *N. reclivate* a subspecies of *N. virginea,* but it seems better left separate. He recognizes Lamarck's original *N. lineolata* as the young stage of *N. zebra* Brug. of northern South America.

A PANAMIC CYRENOIDA

BY H. A. PILSBRY AND JAMES ZETEK

CYRENOIDA PANAMENSIS, new species. Pl. 3, fig. 4.

Near Panama City. Type 155418 and paratypes 155419 A.N.S.P.; others in Zetek collection.

The shell is rounded, modified by the subtruncate posterior end, the weak dorsal curvature and the rather prominent beaks, which turn more to the anterior end than in *C. americana;* plump. Covered with a dull chamois periostracum with some isabella colored concentric streaks or suffusion; this periostracum is very minutely laminate along lines of growth, and is persistent except at the beaks of old specimens. The interior is grayish white. Hinge rather narrow. Anterior limb or both limbs of the left cardinal teeth bifid at summit.

Length, 18 mm.; height, 17.5 mm.; diam., 10.3 mm.

The largest shell seen is 20.7 mm. long. The species of *Cyrenoida* are much alike, but this certainly differs from the Cuban *C. americana* Morel. by its more anteriorly directed beaks, larger size and more persistent periostracum. *C. guatemalensis* Pils. is more nearly circular. *C. floridana* Dall is a smaller shell, with thinner periostracum and narrower hinge. None of these have the bifid cardinal tooth of *C. panamensis.*

It is found in abundance, and has been collected several times, one lot in the collection must have been taken 60 or 70 years ago. "The *Cyrenoida panamensis* came from Pena Prieta which is now the 'exposition site' of the city of Panama, also known as Hatillo. I have it also from California which is also a part of the city, adjacent to the other. In both cases they came from that narrow stretch which is brackish and where mangrove grows. Now the entire area is well drained and built up, but I am sure it will be found further west toward the Rio Mata Asnillo (sometimes written Matasnillo)."

FURTHER NOTES ON EPITONIUM FALLACIOSUM

BY A. M. STRONG

In THE NAUTILUS for July, 1931, W. P. Woodring has a note in which he designates a lectotype for *Epitonium fallaciosum* Dall, 1917, stating that in doing this he "restores" the name to nomenclatorial standing. While there is no question about the desirability of retaining old names wherever possible, in this case it is not possible to do so.

In order that a new specific name be valid it must be accompanied by a description, an illustration or a bibliographic reference. *E. fallaciosum* Dall, 1917, was proposed for the shell "commonly known from California as *S. hindsii* Cpr." with the following additional statement: "Carpenter described from Panama a species of *Nitidoscala* with 8 varices, under the name of *S. hindsii*. By some confusion he later transferred the name in 1865 to a well known shell from California which has 11 to 14 varices." No figure was given or any further description or bibliographic reference. The matter is fully discussed in the Transaction of the San Diego Society of Natural History to which Dr. Woodring refers. It is shown that the only published description of "*S. hindsii*" from California is that by Arnold in 1903 and that the shell he describes should take the name of *Epitonium tinctum* (Carpenter). Arnold's work has been extensively used by California conchologists ever since its publication and as it was largely based on Dall's identifications it may be taken as representing his opinion at that time. This was the shell "commonly known" as *S. hindsii* prior to 1917 and *E. fallaciosum* Dall is placed as a synonym under it. "A well known shell from California with 11 to 14 varices" can not be taken as a description as there are six or eight species of *Epitonium* from California with from 11 to 14 varices. One of the most common of these is *E. tinctum* (Carpenter). Dall in 1921 supplied a bibliographic reference, "Keep, West Coast Shells, p. 183, fig. 174", (1911) which is a figure of a mature specimen of *E. tinctum* (Carpenter).

If *E. fallaciosum* Dall, 1917, is not a synonym of *E. tinctum* (Carpenter), 1864, it must be taken that it is a substitute name for a California species misidentified by Carpenter as *"Scalaria hindsii"* and it clearly ranks only as a musuem label name because it has no published data making it possible for conchologists to recognize it. It therefore would be a *nomen nudum*. Dr. Woodring's choice in 1931 of the paratype of *E. cooperi* Strong, 1930, for the lectotype of *E. fallaciosum* Dall makes the latter practically an exact synonym of the former.

NOTES AND NEWS

MR. D'ALTE WELCH has been appointed assistant in the Department of Mollusca in the Bishop Museum, Honolulu.

THE GENUS GOODRICHIA.—About the time I published this genus (1929), to include two new forms from the Cameroons, both Thiele and Spence figured new species that are apparently members of this same genus. In a modern study, Thiele has made a revision of the Melaniidae which includes all known members in systematic order (including the American Pleuroceridae, which is treated as a subfamily). Thiele places his new form under *Rhinomelania* which he considers a subgenus of *Potadoma*. *Rhinomelania* is entirely different from the figure he has given for his new form, and its affinities even to its proper family is still questioned. The following is a list of the known species of *Goodrichia:*

G. trochiformis Cl., 1929, Bull. Mus. Comp. Zool. 69, p. 118, pl. 1, figs. 3-4 (Genoholotype).

G. pilsbryi Cl., 1929, Ibid, p. 119, figs. 5-6 (considered now as a full species).

G. angulata Thiele, 1928, *Potadoma* (*Rhinomelania*) *angulata* Th., Zool. Jahr. Abt. Sys. 55, p. 387, pl. 8, fig. 12.

G. nyongensis Spence, 1928, *Potadoma nyongensis* Sp., Jour. of Conch. 18, p. 215, pl. 2, figs. 1-3.

In Thiele's classification *Goodrichia* would be placed as the last genus under the subfamily Melanatriinae.—W. J. CLENCH.

A FACSIMILE REPRINT of those parts of the *"Beschreibung der Naturalien-Sammlung der Universität zu Rostock"* by H. F. Link, 1806-1808, which refer to Mollusca, is being prepared for issue on 1st October next. The edition is limited to 150. Copies may be obtained on application to Mr. J. R. le B. Tomlin, 23, Boscobel Road, St. Leonards-by-Sea, Sussex, or to Mr. R. Winckworth, 71, Whitworth Road, London, S.E.25. The price will be £1, or $5.00, post free. Advance subscribers may receive a copy at 15s. or $3.75, post free.

COCHLICOPA IN CHINA.—*Opeas lata* Ping, 1929, Palaeontologia Sinica, Series B, vol. 6, fasc. 5, appears to be only a form of *Cochlicopa lubrica,* of which several have been described from China (Man. Conch. XIX, p. 324). *Opeas fragilis* Ping, from Hopei Province, is an addition to the 25 supposed species of *Opeas* already described from China.—PILSBRY.

DR. CARLOS GUILLERMO AGUAYO Y CASTRO, Assistant Professor of Biology and Zoology, University of Havana, has been appointed a Fellow of the John Simon Guggenheim Memorial Foundation, to pursue taxonomic studies in the fields of Malacology and Entomology.

HELIX EFFUSA Pfr., Malak. Bl. XIII, 1866, p. 78, being a homonym of *Helix effusa* Fischer de Waldheim, Mus. Demidoff III, 235 (1807), may be called *Suavitas monteplatonis.* The type locality is Mt. Platon, Haiti.—PILSBRY.

TYPHIS LOWEI, n. sp.—A small, trivaricose species in which the varices are continuous from whorl to whorl, produced and incurved posteriorly, where the included tubes are terminal. Length, 14.5 mm.; diam., 8 mm. Montijo Bay, R. P., collected by H. N. Lowe. This lovely and curious little *Typhis* will be figured in a paper now in press.—H. A. PILSBRY.

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SHELL COLLECTING IN WEST CENTRAL AMERICA

BY HERBERT N. LOWE

On this my third consecutive winter collecting expedition in west coast ports below our southern border, the first stop was Champerico, Guatemala.

All passengers and baggage landed here have to be lowered over the side of the large steamer to small boats, from which you are again hoisted to a rickety old pier and a tiny narrow gage railway which runs to the Capital.

The coast line looked anything but favorable to a conchologist so I decided to spend the next week visiting the points of interest in the interior and going on by rail to La Union, Salvador, on the Gulf of Fonseca. A new rail connection has just been finished between Guatemala City and San Salvador by which it is now possible to go by rail the entire distance from the U. S. A. to the Gulf of Fonseca. Tagucigalpa in Honduras is now the only Central American capital not to be reached by railroad.

The Champerico coast is a long line of white surf on an endless stretch of black sand beach as far as the eye can reach. I was told that the next three ports below here are similar open roadsteads. If one were here immediately after a storm there might be some luck, but at other times nothing.

La Union, a little town of some five thousand inhabitants, is one of the principal coffee ports in Central America. The coast line here at low tide is a vast expanse of mud flats where the native women and children wade at low tide in search of things edible for the soup pot. The family pigs follow along, also searching out marine delicacies. The *Modiolus guyanen-*

sis Lam. burrows separately in the mud but the smaller *Modiolus mutabilis* Cpr. lives in great masses thirty feet or more across, raised above the surrounding flats, thus furnishing excellent foraging for the hogs at extreme low water.

For two days, during my stay, a stiff northerly wind blew, the last day so bad that the tri-weekly launch from Amapala could not land but had to ride out the storm all that day and night. At the first low tide after, the beach yielded a plentiful assortment of *Modiolus*, *Dosinia*, several species of *Venus* and *Callista* and two species of the lovely red *Tellinas* and other occasional rarities.

The hotel cook for a small "propina" kindly boiled all my shells for me, and after a thorough cleaning, dried them in the hot sunshine in the patio.

The large black and white *Columbella rugosa* Sby. seemed to be very abundant everywhere, but at extreme low tide a few species of rare gastropods could occasionally be found under stones on the mud flats. An interesting species of *Crepidula* was found living on *Modiolus guyanensis* Lam. taking form and color from its host. Chitons and Cypraea were conspicuous by their absence.

Returning one day from "Isla Perico" my boatman rowed me through the mangrove-lined river passage. Here we passed literally acres of bars covered with oysters, all dead, evidently killed by fresh water floods. *Arca tuberculosa* Rve. is very abundant here; all through the mangrove swamps, the snapping together of the valves is plainly heard as one rows along. They are much used for food by the native population, being called *coriles* here, and in Nicaragua by the name *tuchia*. They are eaten raw, like oysters, with lime juice, but the dark mahogany color of the flesh did not look appetizing to me.

At the end of ten days the full moon tides were over and my specimens in condition to send through the mail, so I took the first steamer for Corinto.

Here in place of mud flats were miles of white sand beach. A few pairs of fine *Mactra* and other bivalves came ashore here. I had quite a thrill at collecting my first *Agaronia*

testacea Lk. plowing through the sand at low water in company with the chocolate colored *Terebra luctuosa* Hds. and the sportive little banded *Olivella columellaris* Sby., which, instead of the usual slow gait of that genus, had the jumping movements of a trained seal, usually burying itself in the sand between each wave, leaving only the two spreading tentacles protruding. On one of the best tides, I took a "cayuca" with two native rowers to the Isla Cordon, the island at the entrance to the bay, on which is the lighthouse.

Here I had thrill number two in finding my first live *Siphonaria characteristica.* I supposed I was finding *S. gigas* Sby., but that species did not turn up till Panama, and at no place did I find any intergrades of the two species. Although not a rare species it is so beautiful that one wants to take all in sight until you find that quite impossible, both as to location and tide.

The large *Purpura crassa* Blv. with its beautiful purple stained columella put in its first appearance here. On the mud flats across the bay from town were great colonies of *Olivella volutella* Lk. in six distinct beautiful color forms.

Corinto had about the fewest species of any of the ports visited. After a busy ten days of collecting, I took the train for Granada, that picturesque old Spanish town on the shores of Lake Nicaragua. On returning stopped at her ancient rival Leon and the newer capital Managua, beautifully located on the lake of that name, which in two short weeks after my visit was to be utterly destroyed.

San Juan del Sur the next port south, a picturesque little town, snuggles on one side of beautiful San Juan Bay, palm fringed and hill surrounded. It has the quaint smoky kerosene street lamps and other luxuries of a by-gone period. Water for domestic use is carried into the houses, likewise the bath tubs.

I had an upstairs room at the house of the Comandante with balconies on front and back where I could dry my shells. I soon found the roof to be well populated with sportive tropical rats, which at night seemed to enjoy playing rat billiards with my cypraeas and cones trying to see how many

they could roll down the knot-holes in the floor. Sometimes I would find them half way down the back stairs or rolled under the bed.

One of the redeeming features of the place, however, were the meals, for the Comandante's wife had learned to cook in American style, while on a visit to California.

The day I landed, and for six days following, a stiff north wind howled through the town night and day; it seemed as though the houses would surely all lose their corrugated iron roofs. At last the wind subsided and the balance of my stay was simply perfect. The beach was well supplied with colonies of *Olivella columellaris* Sby. in two color forms, a yellow one which was rather rare; also quite a few *agaronia testacea* Lk.; I took three specimens of a beautiful orange color, like *Cypraea aurantia.*

While collecting them at low tide I noticed to my surprise that before drawing within the shell each individual cast off the posterior part of the foot, about one-third of the entire length. Otherwise the animal could not entirely withdraw into the shell. The species has no operculum. The portion of the foot which it is possible for the mollusk to cast off, is clearly defined by a line of separation on the under side and is actually attached by a mere thread. The detached portion pulsated with life for several minutes after being separated.

On the further side of the bay were plenty of *Siphonaria characteristica,* Columbella, and several species of chitons. *Columbella labiosa* Sby., to my amazement, clung to the sides of exposed rocks like *Thais,* and the *Columbella rugosa* Sby. were sitting around everywhere on top of the rocks, not underneath where most of the genus are supposed to live.

The next bay to the north, "Nacas Colo", proved the most profitable collecting ground. In going there every day I had to pass a huge rubber tree on the edge of the clearing where a large colony of white-faced monkeys had their home. At sight of me they always started a great chattering, wondering, I suppose, at the queer human creature who picked up many shells (Siphonarias) only to throw away the nice juicy animals and keep the useless "conchas".

On the further side of Nacas Colo where the rocks and sand beach meet, I took some fine live *Vasum coestum* Brod. and *Murex regius* in the sand between the rocks; and on top and sides of these same rocks, in much the same location as our *Murex trialatus* in California, was a small colony of the extremely rare *Murex oxycantha* Brod., the young shells quite free from incrustations. This was one of my best finds as I had never taken but one of these before and that was a badly incrusted specimen at Mazatlan.

While digging for bivalves in the clam beds among a mixture of small stones and sandy mud, I was much surprised to find a Sigaretus with brick red body about six inches in length, of course completely enveloping the beautiful brown shell.

Although I offered my native companion a peso each, he was unable to unearth another one, although he set his whole family to digging next day.

On my second visit to Nacas Colo, I explored the near side of the bay. It was the lowest of the February tides and was running out fast, exposing parts of the beach not seen before. When about half way to the outer point, I noticed in a little sheltered cove what seemed to be masses of white foam floating on the water. By the time I had reached the spot I found quite a coral reef exposed so that I could wade out and search for mollusks. Here I took my first living *Coraliophilla madreporarum* Sby. I had taken dead shells at both Tres Marias and Acapulco last year. I had a small iron bar with me and must have smashed up a good wagon load of coral before the incoming tide put a stop to operations. A number of beautiful living specimens of *Cypraea arabicula* Lk. and *Pustularia pustulata* were found underneath the coral masses. The latter species was much larger though paler in color than those found under rocks. The *coraliophila* were almost always clinging to the large inside stems of the coral which necessitated careful search of the broken fragments.

San Juan del Sur was one of the richest collecting grounds I have found on the entire coast. Many small treasures would occasionally turn up such as *Murex erosus* Brod.; *Murex*

obeliscus Ads.; *Murex radiatus* Ads.; *Bursa callata* Brod., and several Tritons, with their thick fur overcoats, would be taken alive at times.

The natives poetically refer to the coral as "los flores del mar" or flowers of the sea; they gather nice specimens and tint them with all colors like Joseph's coat. They brought some around to the Comandancia expecting me to buy some of their weird concoctions. They wanted eighty cents from the American but the comandante's wife finally bought the largest piece for fifteen cents, and it proudly adorns the center table in the *sala* today.

Many of the natives had been telling me what quantities of fine shells there were at Santa Elena Bay, so to satisfy my curiosity, we fitted out for a two-day expedition with the large cabin launch "Chumba". There were sixteen in the party all told, and everyone slept on deck that night except three who went out hunting deer and tapir.

As Sta. Elena is just inside the Costa Rica border we had to stop at a small port, Las Cruces, on the frontier to obtain permission to land. We had the Comandante of San Juan with us and the Comandante of Las Cruces came along also to enjoy the fishing.

At Las Cruces, in getting back on the launch, I and my camera went overboard. After being fished out, I dried myself on deck in the hot sunshine but the poor camera had shipped some salt water in the shutter and refused to work the rest of the trip, besides losing a roll of irreplacable film.

We did a lot of trolling on the way over with excellent results in large fish. We arrived at our destination just about dark and some of the men went ashore to clean the large catch of fish which were salted and dried next morning. By daylight we were all ready to go ashore. The tide was out early and exposed large mud and sand flats at the upper end of the bay where we were anchored.

That morning I took my first living *Strombus galeatus* Sby. which were plowing along through the mud at extreme tide. Across the river mouth were rich clam flats where some of the men dug enough *Venus subrugosa* Sby. for a

meal and others took a whole barley sack full of *Arca tuberculosa* Sby. in the mangroves bordering the river. I took some of the most beautiful color patterns of *Tapes grata* Say I have ever seen. Feeding on the bivalves were many *Murex regius* Wood, often three of the younger ones trying to open the same Dosinia. That morning I took my only living specimens of *Fasciolaria granosa* Brod. and they were beauties too. It seems to be a very rare species all along the coast, even dead shells are rarely seen.

Two days later I had all my Nicaraguan catch cleaned and dried, and I fairly swamped the little San Juan Post Office with packages. After sixteen very pleasant and profitable days at this Nicaraguan port I left for Puntarenas, Costa Rica.

Puntarenas as its name indicates lies on a long sand spit in the Gulf of Nicoya. The inner bay or *Estero* gives anchorage for small craft and river boats which bring down cattle and much valuable hardwood timber from the inland forests. The shore is lined with saw-mills.

The outer side of the peninsula has a fine new steel pier just completed, where the larger steamers land. At extreme low water, many large sand bars make their appearance in the inner bay, each one seeming to have some particular species not found on the others. On one small bar were the only living *Potamides pacificum* taken on the whole trip. On the largest bar at the mouth of the channel I found some giant *Melongena patula* completely in the mud, at another place was a large school of *Conus mahogani* Rve. and at the extreme end fine *Conus*. Many fine color forms of *Olivella volutella* Lk. and an occasional live *Cassis abreviatus* Lk. and *Dolium ringens* Sby. plowing through the sand. I was surprised to find Dolium living on sand flats when at Mazatlan I had taken them in ledges of rock inhabited by *Patella mexicana* Sby. in open wave-beaten locations.

Puntarenas seems to be the metropolis for *Arca grandis*, for I have never seen them in such abundance or size anywhere else—occasionally large pairs would be found which would weigh several pounds each. Great heaps of the shells

would be found back of every hotel and restaurant along the water front. The fishermen gather them at low tide on the sand bars in the bay and keep them in beds between tides ready for use at any time. Many families have large areas paved with the shells on which to dry their laundry in the hot sun. A double row of the shells set in the edge of the cement walks in front of some of the better homes would often be seen. In some parts of the bay were large bars studded with pairs of *Pinna*, but not a living specimen! Evidently they had been killed out by fresh water mud, for on attempting to set foot on these seemingly solid bars, one would sink to the knees in soft ooze, the broken shells cutting one's flesh, making landing next to impossible.

I chartered a launch with crew of three men to cruise the upper part of the Gulf of Nicoya and some of the islands. The collecting as a whole was not what might be expected as the tides were not sufficiently low, but nevertheless a few rarities in bivalves turned up. On the edges of the mangrove swamps I took the finest *Littorina pulchra* (well named!) I had ever seen. They were as large as strawberries and were up as high as my head on the mangrove trees. They were not very plentiful and travel through mangrove swamps is not the best going. On one island the cook gathered a bucket of large *Neritas* and that evening we had Neritas fried with black beans and white rice and were not so bad when one is hungry —the Neritas were rather tough, however. The natives refer to beans and rice cooked together as *Moros y Cristianos*. Quite expressive!

After two weeks of Puntarenas I went by rail to the capital for a few days to cool off in the higher altitude. At San Juan one sleeps under a blanket, while on the coast a sheet is too much.

The third day after reaching Panama, I started out to explore the Montijo Bay country about two hundred miles north. I am sure that sometimes it is well that we do not forsee the days, inconveniences and obstacles incidental to a certain anticipated trip or we probably would not take it. I was rewarded, however, with some of the best collecting of

the winter. Suffice it to say that I left Panama on a Wednesday morning and did not reach Mariato till Saturday midnight. The latter part of the trip was made by launch down the tidal river San Pablo into the Bay of Montijo and almost everything seemed to happen to enliven the trip, from breaking the rudder to running aground on a sand bar, in the black moonless night, opposite Tres Islas.

At Mariato I had very comfortable quarters on the coconut plantation and had a horse at my disposal every day. The upper reaches of the bay are simply endless miles of mangrove swamps, but after passing the river Suai the coast line gradually changes to mud flats, sandy mud, then clear sand beach with many Olivella and numerous bivalves. About three miles further a long reef of shelving rock runs out a good half mile from shore, the outer part is only accessible at the lowest tides of the year for an hour or so, as the tides of twenty feet or more run in very rapidly once they have turned. I made daily trips to this reef for five days and while my horse dozed in the shade of a treee by the beach, his master turned literally tons of rocks and was well rewarded by lovely Cypraea, Cones, Mitra, Cardita, Murex and Triton, in no great quantity, but enough to keep up one's enthusiasm.

Once more I had to thank the hermit crabs for some of my rarest species—much like the location in Mazatlan where I had such good luck two years ago, a small bunch of small rocks on the edge of the mud flats yielded three species of *Cancellaria* and several Pleurotomas, Terebas, etc., all of which I had dredged in deep water off the Mexican coast. Some of them were as fresh and perfect as living shells.

As the tides were over I reluctantly bade farewell to Mariato and after a trip of two days and two nights by dugout canoe, on foot, on horseback and lastly by autostage, I finally reached Panama and civilization once more. Two days later I left for Taboga Island, reputed to be very rich in molluscan life. During my nine days' stay, there were the full moon tides of April which were extremely good. I worked diligently every day turning over tons of rock and coral both there and on Taboguilla and I must say that at

times no doubt Taboga is very rich but during my stay it was the poorest collecting, regards number of species, of any place I have visited on the coast of Central America.

My dredging this trip has been rather a failure. At La Union I was unable to secure a launch. At Corinto I had the Pilot's boat two mornings with fair success. At San Juan del Sur after the third haul we lost the dredge completely and had to have another one made after much difficulty.

At Puntarenas I could not find any suitable dredging ground; too much mud.

At Taboga, the very opposite, coarse gravel but no shells—the gravel so coarse in fact it would not wash through the dredge net. At a small island between Taboga and the mainland we made a few hauls with mostly live *Pecten circularis* as results. These seem to come into shallow water only at certain seasons of the year—probably at spawning time.

The *Cypraea arabicula, Ranella caelata* and several *Thais* were all spawning on the rocks at this season.

NEW LAND SNAILS FROM IDAHO AND EASTERN OREGON

BY H. BURRINGTON BAKER

Among the species collected in the Idaho Transition-Area during the summer of 1931, the following appear to be new: *Anguispira nimapuna* and *Discus (Gonyodiscus) marmorensis* from Idaho and *Megomphix lutarius* from eastern Oregon. Arguments are presented to show that the generic term *Discus* should take preference over the more familiar *Gonyodiscus*. Types are in the Academy of Natural Sciences of Philadelphia.

ANGUISPIRA NIMAPUNA, new species. Plate 5, figs. 4 to 6.

Type locality near northeast corner of section 32, T. 32 N., R. 4 E. (Boise Meridian) at about 116° W. Long. and 46° 5′ N. Lat.; quite common in a small, shallow, lava rock-slide near bottom (altitude about 1,350 feet) of southwest-facing

slope (with sparse brush and a few yellow pine) on east side of South Fork of Clearwater River, across road from monument to Chief Joseph (on battleground of Nez Perce or Nimapu Indians), one mile south of Stites, Idaho County, Idaho. Aestivating (Aug. 24), especially near roots of scattered, service-berry bushes; more deeply hidden than *Polygyra ptychophora* and an *Oreohelix,* but less so than *Polygyra mullani* and *Polygyrella polygyrella,* which buried themselves in the black, coarsely granular soil beneath the rockslide; not found in the adjacent, larger slides or at any other locality.

Shell (pl. 5, figs. 4 to 6) small (for genus), much depressed (type) to depressed conical, angulate at periphery; olive-brown to straw-color, often with very vague, darker flammulae, and with greenish tinge predominating in young specimens; translucent when fresh and with satin-like luster. Whorls 5¾ (type), gradually increasing and depressed. Embryonic whorls 2; first almost smooth but with weak traces of the oblique sculpture of *A. alternata;* second gradually assuming nepionic ribs. Young shells more sharply angulate than adults. Last whorl with 54 (type), heavy, low, widely spaced growth-ribs (about ⅕ as wide as interspaces), which are positively arcuate above periphery and negatively so below (much as in *A. alternata*), and with extremely delicate, closely spaced, fairly regular, secondary riblets which are crossed, in the major interspaces, by fine, irregular, spiral striae. Umbilicus large, 3.19 (type) to 3.64 (paratype) times in major diameter; ogival. Aperture depressed, angulate. Peristome simple and sharp; markedly oblique (about 50° to axis of shell); emarginate just below suture.

DIMENSIONS

	Altitude	Maj. diam.	Min. diam.	Alt. apert.	Diam. apert.	Whorls
Type	5.33	229 (12.2)	201 (10.7)	58 (3.09)	146 (4.52)	5¾
Paratype	6.14	193 (11.9)	178 (10.9)	49 (3.01)	157 (4.72)	6

A. nimapuna is the first *Anguispira* of the typical group that has been found west of the Rocky Mountains. Its relatively thin shell, very delicate microscopic sculpture and al-

most uniform coloration immediately distinguish it from the species of the eastern United States.

DISCUS (GONYODISCUS) MARMORENSIS, new species. Plate 5, figs. 1 to 3.

Type locality about 116° 20′ W. Long., 45° 35′ N. Lat., elevation near 3,000 feet; quite infrequent in steep, north facing, mossy talus slope, shaded by fairly open stand of mesophytes (dominated by grand fir and large yew), below cliffs of white, crystalline marble that tends to crumble into angular gravel and sand, about 2 miles up middle fork of John Day Creek canyon, which opens into Salmon River canyon near southeast corner of section 14, T. 26 N., R. 1 E. (Boise Meridian), Idaho County, Idaho.

Aestivating (July 30) 1 to 3 feet below surface on dirty rocks which were wedged between and against the roots of a large clump of dwarf maple, along with *Radiodiscus abietum, Microphysula ingersolli, G. cronkhitei, Polygyra mullani, P. ptychophora, Anguispira kochi, Oreohelix haydeni, Pristiloma idahoense, P. subrupicola,* etc.

Shell (Pl. 5, figs. 1 to 3) small but heavy, moderately (type) to decidedly depressed, dome-shaped above with flatter base; thread-carinate at periphery; dull, with narrow varices of buff and brown alternating with broader flammulae of dark chestnut (often more evident in young and in bleached shells than in fresh adults). Whorls 6½ (type), very gradually increasing; suture abruptly impressed. Embryonic whorls 2; half of first almost smooth but remainder with fine, protractive and retractive striae; about ¼ of last showing slight traces of nepionic ribs. Young shells biconvex, much more depressed but with vaguer carina than adults. Last whorl with lateral surface about 40° from vertical, with moderately convex base and with peripheral angulation marked off as a thread-carina by shallow grooves above and below it; with about 70, low, heavy growth-ribs, which are ⅓ to ½ width of interspaces and which extend from suture to below periphery but disappear almost completely on most of base, although traces are often present on

the umbilical wall; with microscopic sculpture (more distinct above carina) consisting of irregular, anastomosing growth-wrinkles, crossed by occasional spiral striae that seldom can be traced beyond a single major interspace. Umbilicus large and funicular, 2.94 times in maj. diam. Peristome simple and sharp, slightly oblique (about 30° to axis of shell), very slightly emarginate below suture.

DIMENSIONS

	Altitude	Maj. diam.	Min. diam.	Alt. apert.	Diam. apert.	Whorls
Type	4.64	175 (8.13)	166 (7.72)	39 (1.81)	156 (2.82)	6½

Discus has been used here as the genus and *Gonyodiscus* as a section for the following reasons. Fitzinger (1833, Beitr. Landesk. Oesterr. III: 98, 99) proposed two genera which included species that are now combined in one. *Gonyodiscus* (p. 98) had, for monotype, *G. perspectivus* (Meg. v. Mühlf.), from southern Europe, which should not be confused with Say's preoccupied name for the nearctic *D. patulus* (Desh.). *Discus* (p. 99) included its type by subsequent designation of Gray (1847, Proc. Zoöl. Soc. London: 174), *Helix ruderata* Studer, which is very close to the nearctic *D. cronkhitei* (Newc.). Page priority was formerly considered valid, and *Gonyodiscus* has been given precedence over *Discus* by most recent authors, but the International Commission has wisely decided (Opinion 40) that priority (at least in the case of species) is not affected by mere paginal sequence, but must be determined by subsequent selection. So far as I can ascertain, H. and A. Adams (1855, Gen. Rec. Moll. II: 116) were the first to take definite action in the present case and they used *Discus* as a genus, with *Gonyodiscus* as one of its synonyms.

Discus marmorensis is very different from any of the other nearctic species. It does resemble considerably, both in shell and soft parts, the palearctic *D. perspectivus* (Mühlf.) but has a much heavier, more elevated shell, with greater contrast between the sculpture of its apical and that of its basal sides. It is apparently the first nearctic species of *Gonyodiscus*, an otherwise palearctic group.

MEGOMPHIX LUTARIUS, new species. Plate 5, figs. 7 to 9.

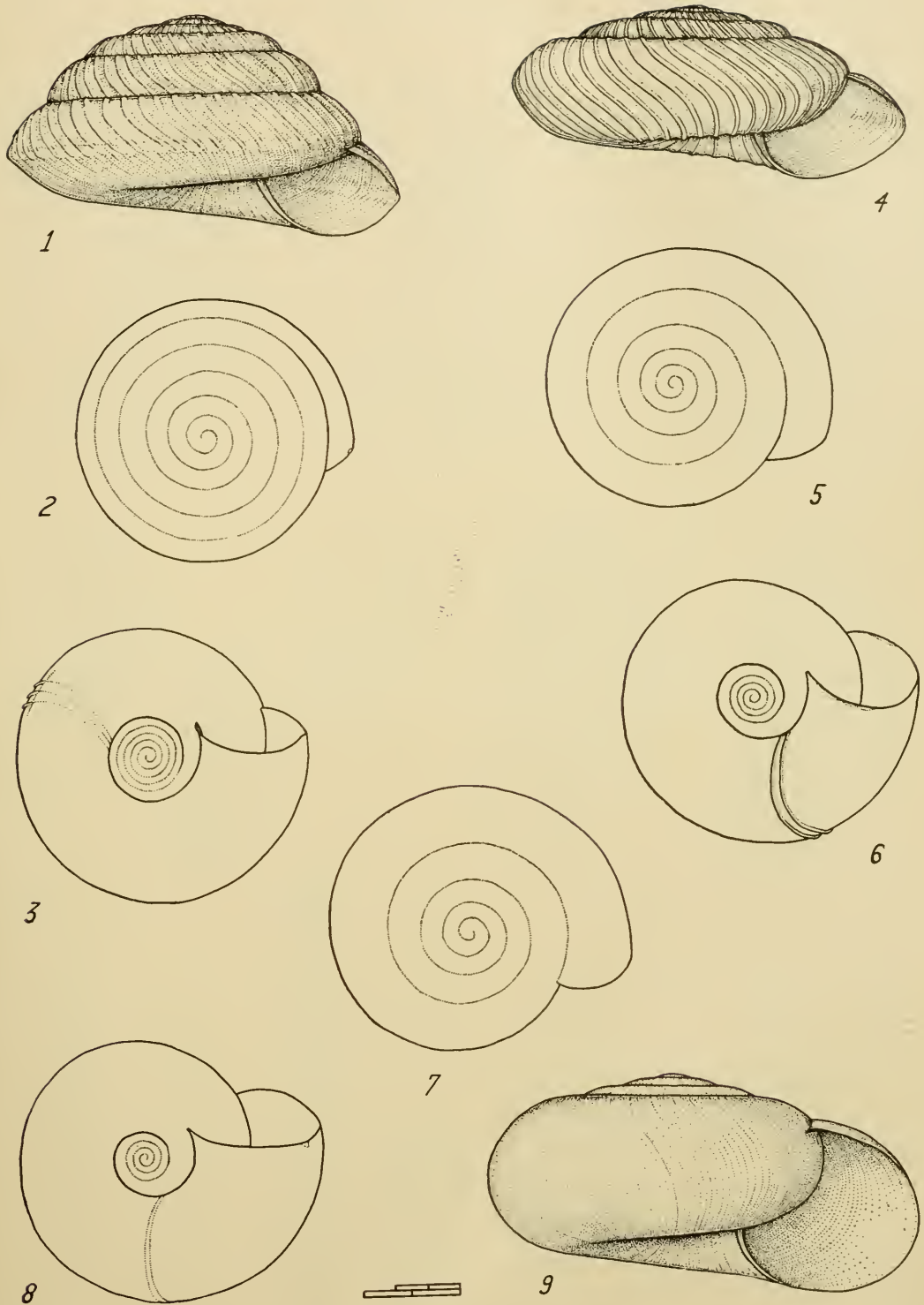
Macrocyclis hemphilli W. G. B. (1886, 2nd Suppl.: 25), Weston, Ore. (A.N.S.P. 11793); not W. G. B. (1879). *Circinaria hemphilli* Pils. (1898, Naut. 11: 128), Walla Walla, Wash. (A.N.S.P. 11795). Cf. *Haplotrema hemphilli* Henderson (1929, Univ. Colo. Studies 17: 97).

Type locality about 118° 25′ W. Long., 45° 45′ N. Lat., elevation over 2,000 feet; frequent on an almost vertical, lava exposure, overgrown with dry moss, ferns and scattered bushes, below north-facing slope with Douglas fir *(Pseudotsuga)* and only a few feet from the practically dry bed of Pine Creek, about 5 miles above Weston, Umatilla Co., Oregon. Aestivating (Aug. 10), buried 2 to 5 inches under yellowish dust and dirt in hollows of the outcropping ledges, near *Polygyra, Microphysula, Haplotrema, Anguispira, Radiodiscus abietum, Gonyodiscus cronkhitei, Pristiloma idahoense, P. subrupicola,* etc.

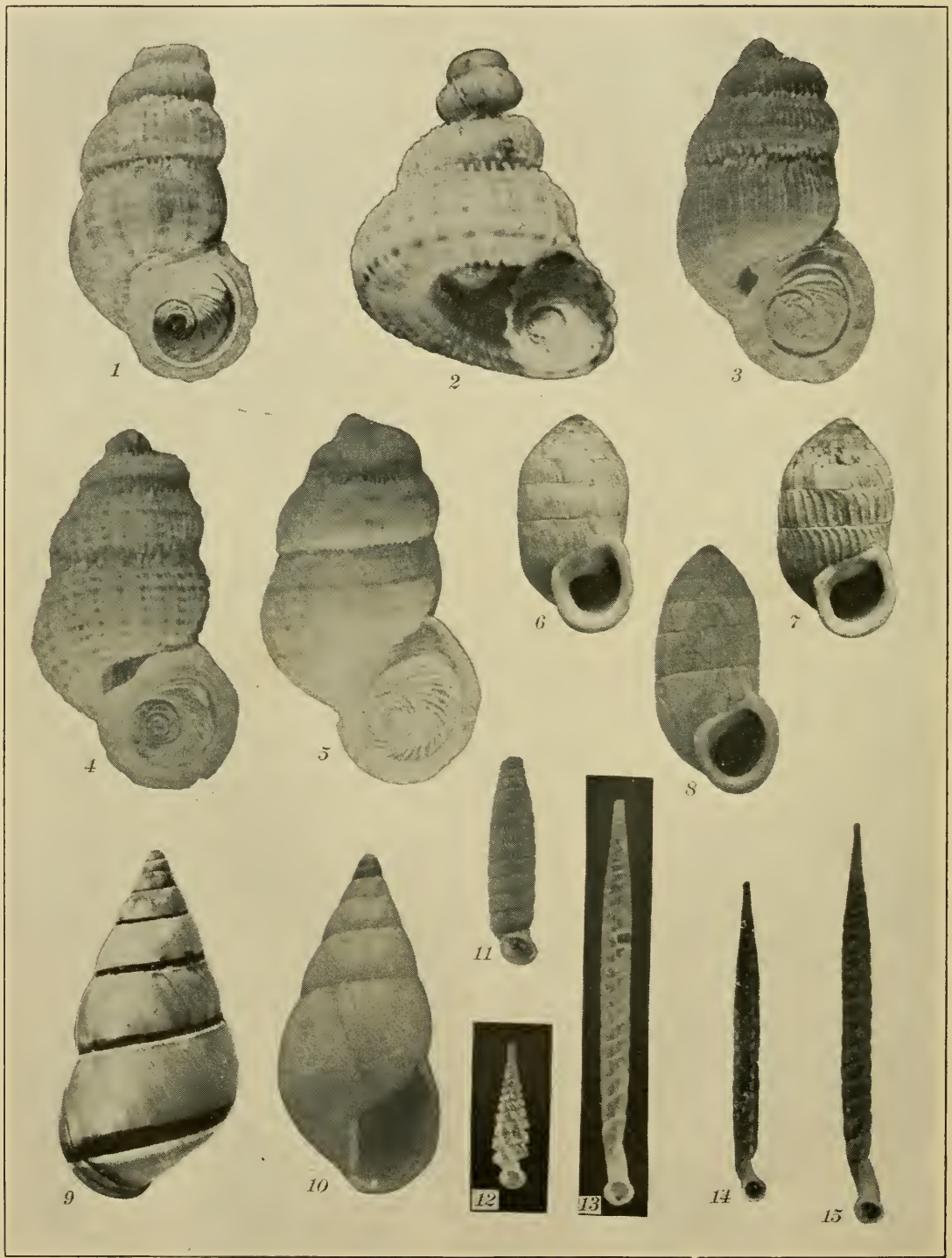
Shell (Pl. 5, figs. 7 to 9) quite small, thin and much depressed; rather dull, light corneous with a slight greenish tinge. Whorls 5¼ (type), quite gradually increasing; suture well impressed. Embryonic whorls 2, almost smooth but with extremely weak traces of fine, closely spaced, spiral striae and with nepionic growth-lines gradually appearing on last ¼ whorl. Last whorl terete, slightly descending, with closely spaced, low but distinct growth-wrinkles (more evident than in *M. hemphilli*), which are crossed by exceedingly fine, irregular, closely spaced, spiral striae (only visible under high magnification and in strong light). Umbilicus large, 3.35 times in maj. diam. Aperture well rounded except near sutural angle where outline is more convex. Peristome thin and sharp, easily broken (all shells show mended places); slightly arcuate above periphery and almost vertical (about 20° to axis of shell).

DIMENSIONS

	Altitude	Maj. diam.	Min. diam.	Alt. apert.	Diam. apert.	Whorls
Type	4.59	196 (9.01)	172 (7.88)	75 (3.45)	108 (3.73)	5¼
Paratype	5.14	204 (10.5)	177 (9.1)	72 (3.68)	115 (4.25)	5¼



1—3. Discus marmorensis H. B. Baker. 4—6. Anguispira nimapuna H. B. Baker. 7—9. Megomphix lutarius H. B. Baker.



New Cuban Shells—Torre, Aguayo, and Clench

M. lutarius is very closely related to *M. hemphilli* from western Oregon and Washington, but is a smaller shell and has relatively stronger growth-wrinkles, which give it a duller sheen. These differences, although apparently constant, are confessedly smaller than the range of variation displayed in some of the other, better known species of northwestern snails. The anatomy of paratypes of *M. lutarius* is also very similar to that of the genotype (H. B. B.; 1930, Naut. 43: 96, pl. 5, fig. 1-4), but the spermoviduct of the new species is much broader basally; its albumen gland is relatively larger; the apical half of its more elongate talon is recurved; and the 7 lobes of its ovotestis are not so completely subdivided. Also, its radular formula is 5+9+7+1+21, with 101 transverse rows, and the inner marginals are less elongate and more nearly intermediate between the laterals and the outer marginals. However, the differences in the spermoviduct and the albumen gland are perhaps due to the more complete maturity of the western animals (even of considerably smaller individuals than the type), while the peculiarities of the ovotestis and radula might be correlated with size.

Description of Plate 5

All figures are made with aid of camera lucida. Scales represent 2 mm.; upper is for fig. 4 and lower for figs. 1 and 9.

Figs. 1-3. *Discus (Gonyodiscus) marmorensis* (John Day Creek, Idaho). Vertical view and apical and basal outlines of type shell (A.N.S.P. 156442).

Figs. 4-6. *Anguispira nimapuna* (Stites, Idaho). Vertical view and apical and basal outlines of type shell (A.N.S.P. 156441).

Figs. 7-9. *Megomphix lutarius* (Weston, Ore.). Apical and basal outlines and vertical view of type shell (A.N.S.P. 156443).

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SOME NEW CUBAN UROCOPTIS

BY CARLOS DE LA TORRE

UROCOPTIS HETEROSCULPTA, sp. nov. Plate 6, fig. 11.

This species belongs to the group of *U. crispula* Pfr. by having the internal axis with two lamellae, the superior one being larger. It is similar in size and shape to *U. artemisiae* (Gundlach), differing from it and from any other species of the group by its peculiar sculpture; the axial riblets being much more closer together on the last 4-6 whorls, often having a sharp transition between the two forms of sculpture. The length of the shell ranges from 12.5 to 17 mm., the *holo*-type measures 13.5 mm. in length and 3 mm. in diameter.

Holotype: M. C. Z. No. 47987. Found on the stone walls of "Finca El Inglés", near Sierra del Grillo, Madruga, Havana Province. (C. G. Aguayo, collector.) *Paratypes:* M. C. Z. No. 60831 and 80609, from the same locality. Also in the author's collection and in the collection of C. G. Aguayo.

UROCOPTIS SCALARINA PORTUONDI, subsp. nov. Plate 6, fig. 12.

This subspecies differs from the typical form of the species found in "Abra del Yumuri", Matanzas, by its stouter form and stronger sculpture, which is formed by a less number of axial riblets, (14-16 in *U. scalarina,* 8-9 in *U. s. portuondi.*)

Holotype: M. C. Z. No. 47901, from "Sierra del Grillo", Madruga, Havana Province. E. Portuondo, collector. It measures: length 9.6 mm., diam. 2 mm. Aperture 1.8 mm. width. *Paratypes:* M. C. Z. No. 47892, from the type lot. Also in the author's collection and in the collection of C. G. Aguayo.

UROCOPTIS MELLITA, sp. nov. Plate 6, fig. 14.

Shell slender, very long, very brittle, translucent, often decollated, cylindrical, the first whorls forming an acute cone. Whorls convex, 28 to 30 in complete specimens, 7 to 9 less in decollated shells. Last whorl very long, disjointed. Color dark honey. Surface smooth and brilliant, with obsolete axial undulations, which become more numerous and

conspicuous on the last whorl. Columellar axis with a twisted revolving ridge; obsolete on the last whorls. Aperture circular, peristome white and expanded. The length of the shells ranges from 17 to 23 mm.

The holotype measures: length 20 mm., diameter of the largest whorl 1.6 mm. Aperture 1.2.

Holotype: M. C. Z. No. 47900, from "Finca El Inglés". Sierra del Grillo, Madruga. Habana Province. C. de la Torre, collector. *Paratypes:* M. C. Z. No. 52767 and 84865, from the type lot. C. G. Aguayo, collector. M. C. Z. No. 52969, from Sierra del Grillo, Madruga. N. W. Lermond, collector. M. C. Z. No. 78026, from the type locality. M. Jaume, collector. M. C. Z. No. 86605, from the type locality, P. J. Bermúdez, collector. There are also paratypes on the author's collection and in the collection of C. G. Aguayo.

UROCOPTIS MELLITA PERLONGA, subsp. nov. Plate 6, fig. 13.

This subspecies differs from *U. mellita,* by its larger size, thinner columellar axis, longer last whorl, paler coloration and stronger sculpture; the axial undulation being substituted by very riblets widely spaced. The holotype measured: length 25.5 mm., diam. 2 mm. Aperture 1.4 mm.

Holotype: M. C. Z. No. 47899, from Loma de la Reforma, Pipian. Habana Province. C. de la Torre, collector. *Paratypes:* In the author's collection and in the collection of S. G. Aguayo.

Although this subspecies is easily distinguishable from the typical form, it is so closely related to it by its glossy surface and its shape, that it seems to be convenient to consider it only as a subspecies.

WEST INDIAN MOLLUSKS NO. 2—NEW CUBAN CERIONS

BY C. DE LA TORRE AND W. J. CLENCH

CERION AGUAYOI, sp. nov. Plate 6, figs. 6, 7.

Shell solid, rimately umbilicate, cylindrical to subcylindrical. Most specimens slightly wider above the middle.

Color white to greyish white. Interior of aperture occasionally slightly pink-yellow. Whorls flat, 9½ to 10½. First two nuclear whorls glassy, striate axially with fine hair like ridges. Remaining whorls opaque. The axial striation is generally lost beyond the fifth whorl though some specimens retain the striation throughout. Spire forming usually an angle of approximately 90°. The angular portion is composed of six to seven whorls, the remainder are more or less flat sided. Aperture rounded to rounded-ovate; fully adult specimens are somewhat holostomous, in others the parietal wall is lightly calloused. Peristome white, reflected. Columella straight. Parietal tooth well centered, but not sharply developed. Columellar tooth usually present but slightly developed, occasionally obsolete or reduced to a slight thickness on the columella.

Sutures very slightly indentated. Sculpture composed of axial growth lines irregularly spaced on the majority of specimens examined. Certain specimens, however, exhibit a strong tendency to develop axial ribs which are an apparent outgrowth of the sculpture exhibited on the early whorls of all specimens.

On the basal area of the body whorl the riblets become fine and more numerous.

Length	Width	Ap. length	Ap. width	
26 mm.	14.5 mm.	8 mm.	7.5 mm.	*Holotype*
23	13.5	7	6	*Paratype*
23.5	13	6.5	5.5	*Paratype*
23.5	13	7	6	*Paratype*
24.5	13	7	5.5	*Paratype*
25.5	15	8	6	*Paratype*
26	13.5	7	5.5	*Paratype*
26.5	14.5	8	6	*Paratype*
26.5	15	8	7	*Paratype*
29	14	8.5	7	*Paratype*

Holotype: M. C. Z. No. 47902, Road to Caletones, about 6 Km. W. of Gibara, Oriente, Cuba. C. G. Aguayo, collector, August, 1927. *Paratypes:* M. C. Z. No. 47903 and 52783, and in collections of C. de la Torre and C. G. Aguayo.

This species belong to the group of *C. proteus* Gundlach, and like it is found in Gibara, Cuba. *C. aguayoi* is restricted to a very small area about 4 miles from *C. proteus*. It differs from *C. proteus* by its smaller size and by the shape of the shell, the apex being rounded, less obtuse. In *C. proteus* the whorls are very flat and irregularly at the sutures, often protruding slightly beyond the next whorl. An occasional specimen of *C. aguayoi* shows a trace of the peculiar condition.

CERION AGUAYOI BEQUAERTI, subsp. nov. Plate 6, fig. 8.

This subspecies differs from the typical form in being larger, more cylindrical and the spire more tapering. In the specimens examined by us there is no indication of the "wide point" which occurs just above the middle in both *C. proteus* and *C. aguayoi*. The locality of *C. aguayoi bequaerti* is about 50 Km. east of Gibara, the locality of the other forms.

Length	Width	Ap. length	Ap. width	
30.5 mm.	15 mm.	8 mm.	7 mm.	*Holotype*
30.5	14	8	7	*Paratype*
29.5	14.5	7	8	*Paratype*
29	14.5	7	8	*Paratype*
28	15	8	7	*Paratype*
25.5	13	6.5	6	*Paratype*

Holotype: M. C. Z. No. 86177, dunes at Lucrecia lighthouse, near Banes, Oriente, Cuba. *Paratypes:* M. C. Z. No. 86176.

This subspecies is probably a direct offshoot of *C. proteus* stock and apparently may be a form of parallel development similar to that of *C. aguayoi*. However, it seems best in our present understanding of these forms to consider it a subspecies of the latter species to which it more closely approximates.

NEW SPECIES OF OPISTHOSIPHON FROM EASTERN CUBA

BY C. G. AGUAYO

This paper is the first of a series to be published on Cuban Mollusks, for which the author is indebted to the Guggen-

heim Foundation in awarding him one of its fellowships which permits him to study in American Institutions. The author also wishes to thank Dr. Thomas Barbour for permitting him to work in the Museum of Comparative Zoology; Dr. Carlos de la Torre for many wise suggestions, and Mr. William Clench for his useful criticism.

The malacological fauna of the region of Holguin, Cuba has been almost unknown; Gundlach and Arango had obtained but very few species from this locality. During the year 1914, Dr. Carlos de la Torre and the late John B. Henderson visited "El Yayal", five miles south of the town of Holguin, but as yet the results of their trip remains unpublished.

From 1926 to 1931 I made several excursions to that region, and had the opportunity of finding several new species of land shells among which, those of the genus *Opisthosiphon* were very remarkable. They constitute a group of umbilicate shells quite different from most of the remaining Cuban species of that genus.

In addition to the new species I include here some notes relating to *Opisthosiphon aguilerianum* (Ar.), whose generic position and type locality have been fixed by the Cuban naturalist de la Torre, who has been kind enough to permit me to publish an abstract of his notes about this species.

OPISTHOSIPHON AGUILERIANUM (Arango).

Cyclostoma aguilerianum Arango, Ann. Real. Acad. Cienc. Med. Fis. Nat. Habana, t. XII, p. 280. 1876.

Tudora ? aguileriana Arango, Fauna Malacologica Cubana, p. 21. 1878. Crosse, Journ. Conch. 39, p. 301. 1890.

The generic status of this species was not established by Arango in his original description owing to the lack of the operculum, but later he refers it to the genus *Tudora* on account of the similarity of the shell to *Tudora moreletiana* Petit, now an *Opisthosiphon*. He failed to assign the locality and only says: "Hallado en la Isla por Mr. Wright".

De la Torre considered it as an *Opisthosiphon*. He says: "In my opinion *Cyclostoma aguilerianum* was a Bahama

species related to *Op. bahamensis* and I supposed it to be wrongly considered as a Cuban shell, but three years ago I received some shells from Gibara, Eastern Cuba, sent by Dr. Lauredano Gonzalez, in which I recognized the *Op. aguilerianum* Ar., whose type locality can now be established with certainty."

The specimens given to me by Dr. de la Torre range from 9.5 to 11 mm. in length, and from 5.5 to 5.8 mm. in diameter.

OPISTHOSIPHON AGUILERIANUM HOLGUINENSE, subsp. nov.
Plate 6, fig. 1.

The shell is ovate-conic; the spire decollated, leaving 3½ moderately convex whorls, the last being slightly free, openly umbilicate. The suture is well impressed. The color is light straw, ornamented by encircling rows of elongated pale-chestnut spots (often obsolete) arranged in axial rows. The sculpture consists of axial riblets regularly spaced, which expand into hollow white somewhat flattened bulbs at the suture above. The spiral sculpture is restricted to the umbilical area of the shell. The aperture is vertical, oblong-ovate. The peristome is double; the inner peritreme projects slightly, the outer peritreme is widely expanded, concentrically ribbed, adnate to the preceding whorl, without any tendency to project backward over the umbilicus. Above the aperture it is slightly bent backward and merges into a recurved siphon which passes into the space behind the last whorl. The siphon communicates with the interior of the shell through a pore. The operculum is typical of the genus. The length ranges between 8.8 to 12.2 mm.

Holotype: M. C. Z. No. 47990, from Cerro San Juan, Sao Arriba in Holguin, province of Oriente. Collected by C. G. Aguayo, January, 1930. It measures: length 11.5 mm., diameter 6 mm., length of the aperture within 3 mm., width of the aperture within 2.5 mm. *Paratypes:* M. C. Z. No. 47991, and in the author's collection, from the type lot, collected by García Castañeda and Aguayo.

This subspecies is closely related to the typical form but differs by the larger number of axial riblets, which are

nearly straight, not incurved near the bulbs above as in *O. aguilerianum;* the bulbs are less globose.

OPISTHOSIPHON CAROLI, sp. nov. Plate 6, figs. 2, 3.

The shell is ovate-conic, spire decollated, leaving three and a half moderately convex whorls, the last very slightly free; openly umbilicated, apical whorls disjoined as in genus *Ramsdenia*. The color ranges from chestnut to light straw, ornamented by encircling rows of elongated chestnut spots, giving an appearance of axial rows. The sculpture is formed by axial riblets irregularly spaced. Most of the riblets expand into hollow white bulbs at the sutures, the upper bulbs being much larger. Spiral sculpture consists of series of crenulations on the axial riblets, forming regular encircling rows. Aperture vertical, rounded-oval; peristome double, the inner peritreme is projecting, the outer is expanded, adnate to the whorl above, bent forward on the right side, straight on the left side; above the posterior angle the outer peritreme is expanded into a projection affixed to the whorl, the face of this is concentrically ribbed. Operculum typical of the genus.

Holotype: M. C. Z. No. 47992. *Paratypes:* M. C. Z. No. 47993 and in the author's collection.

Described from numerous specimens collected by the author under stones at "Loma de la Caridad", 30 Km. west of Holguin.

Measurement of the type: length 11 mm.; diameter 6.2 mm.; length of the aperture within 3 mm.; width of the aperture within 2.5 mm.

The shell ranges from 9 to 12 mm. in length, and the average numbers of riblets counted was 67.

This species differs remarkably from any other of the known *Opisthosiphon* by the disjoined apical whorls, but belongs to the group of *O. sculptum* and *O. echinatum* of the S. E. of Cuba.

Named after the Cuban malacologist Dr. Carlos de la Torre, to whom I am indebted for most of my knowledge in the field of zoology.

OPISTHOSIPHON RIVORUM, sp. nov. Plate 6, fig. 4.

Similar to *Op. caroli* in its general features, but differing in the following characters: apical whorls not disjoined; color generally lighter (in 68 specimens only 8 were dark colored); axial riblets wider in spacing and less in number (average 54), with hollow white bulbs in all the riblets at the suture both above and below; the crenulations stronger but less in number; the peritreme is more bent forward at the right side.

Holotype: M. C. Z. No. 47994. It measures: length 11.5 mm., diameter 6.6 mm.; length of the aperture within 3 mm.; diameter of the aperture within 2.5 mm. *Paratypes:* M. C. Z. No. 47995 and in the author's collection.

Described from several specimens collected at "Los Arroyos", 28 Km. West of Holguin, by C. G. Aguayo, August, 1928.

The shells range from 9 to 12.3 mm. in length.

OPISTHOSIPHON QUESADAI, sp. nov. Plate 6, fig. 5.

Shell ovate-conic, decollated, leaving three and a half moderately convex whorls, the last very slightly free, openly umbilicated. Color light straw with encircling rows of elongated light chestnut spots, giving an appearance of axial rows. The sculpture consists of numerous axial riblets. Most of the riblets expand into hollow white bulbs at the suture above. Spiral sculpture formed by series of feeble undulations of the axial riblets. Aperture vertical, ovoid; peristome doubled, the inner peritreme is expanded, adnate to the suture above, bent forward in the right side, slightly bent backward in the left side. There is a projection affixed to the whorl above the posterior angle of the outer peritreme. The length of the shell ranges from 10.2 to 12 mm.

Holotype: M. C. Z. No. 47996, from "La Cantera", San German, Holguín. Collected by Raul Quesada, August, 1928. It measures: length 11.7 mm., diameter 7 mm.; length of the aperture within 3.5 mm.; width of the aperture within, 2.7 mm. *Paratypes:* M. C. Z. No. 47997, and in the author's collection.

Differs from the two above species by the more numerous and less conspicuous axial riblets; the less projecting spiral sculpture; the larger diameter, and the form of the outer peritreme which is bent backward in the left margin. The distribution of the brown spots is also different.

Named for my friend R. Quesada, its discoverer.

TWO NEW CUBAN UROCOPTIS

BY C. G. AGUAYO

This description of two new species of *Urocoptis* from Madruga, Havana Province, Cuba, serves as sequel to the previous paper by Dr. Carlos de la Torre in which he makes known the *Urocoptis mellita* from that same region and to which the former species are related.

UROCOPTIS TENUISTRIATA, sp. nov. Plate 6, fig. 15.

Shell slender, very long, subfusiform, the largest diameter being in the first third of its length, suddenly tapering to the apex, and evenly reducing the diameter toward the base. Whorls convex, last one long and disjointed. Color dark horn. Surface opaque. Sculpture formed by dense and fine axial oblique striations imparting a wax-like luster. Columellar axis very stout and slightly twisted. Aperture rounded, peristome white and expanded. The length ranges from 22 to 25 mm., but most specimens have a length of 23 mm.

The holotype measures: length 25 mm., diameter 2 mm. Aperture 1.3 mm.

Holotype: M. C. Z. No. 47898, from "Finca El Inglés", Madruga, Havana. C. G. Aguayo, collector. *Paratypes:* M. C. Z. No. 60858, from the type lot. M. C. Z. No. 84866, from the same locality. P. J. Bermudez, collector. M. C. Z. No. 52970, from Sierra del Grillo, Madruga. W. M. Lermond, collector.

Paratypes also in the collection of Dr. Carlos de la Torre and in the author's collection.

Similar to *U. mellita* Torre, differing by its larger size, larger diameter (in specimens of 20.8 mm. in length, *U.*

mellita had a diameter of 1.5 mm., and *U. tenuistriata* of 1.9 mm.) ; stouter apical third; rough sculpture, different appearing surface, larger basal whorl, and stouter columellar axis.

The habit of this species is somewhat different to that of *U. mellita,* the last being found over the limestone cliffs or "paredones", and the *U. tenuistriata* on the stone walls, or the big stones at a certain distance from the mountain. It has been distributed under the manuscript name of *U. mellita perlonga* Torre, with which it was wrongly identified. The true *U. m. perlonga* from "Loma de la Reforma", Pipian, herein described, has not been sent out in exchange.

Urocoptis tenuistriata clenchi, subsp. nov.

Shell slender, subcylindrical, evenly tapering toward the apex from whorls 6-7. Very seldom decollated. Whorls 23-25, slightly convex. The largest diameter being at the whorl 7. Last whorl disjointed. Aperture rounded, peristome white, expanded. Sculpture formed by very numerous and minute axial riblets or striations. Columellar axis very slender and twisted. Color and luster as in *U. tenuistriata.* The length of the shell ranges from 17-21 mm. The holotype measures: length 19 mm., diameter 1.9 mm. Aperture 1.2 mm.

Holotype: M. C. Z. No. 47893, from "Madruga, Km. 67 on carretera". W. S. Brooks, collector. *Paratypes:* M. C. Z. No. 36863. Same data as holotype. Also in the collection of C. G. Aguayo, from the type lot.

This shell seems to be intermediate between *U. mellita* and *U. tenuistriata.* Differs from *U. mellita* by its size, wider diameter, rough sculpture, and by its fewer whorls; from *U. tenuistriata* by its smaller size, fewer whorls, shape of the shell, and by its internal axis, which is much thinner.

Description of Plate 6

Fig. 1. *Opisthosiphon aguilerianum holguinense* Aguayo, subsp. nov. (Holotype), 4×.

Fig. 2. *Opisthosiphon caroli* Aguayo, sp. nov. (Paratype)), 8×.

Fig. 3. *Opisthosiphon caroli* Aguayo, sp. nov. (Holotype), 4×.

Fig. 4. *Opisthosiphon rivorum* Aguayo, sp. nov. (Holotype), 4×.
Fig. 5. *Opisthosiphon quesadai* Aguayo, sp. nov. (Holotype), 4×.
Fig. 6. *Cerion aguayoi* Torre and Clench, sp. nov. (Holotype.)
Fig. 7. *Cerion aguayoi* Torre and Clench, sp. nov. (Paratype.)
Fig. 8. *Cerion aguayoi bequaerti* Torre and Clench, subsp. nov. (Holotype.)
Fig. 9. *Liguus fasciatus nobilis* Clench and Aguayo, subsp. nov. (Holotype.)
Fig. 10. *Liguus blainianus jaumei* Clench and Aguayo, subsp. nov. (Holotype.)
Fig. 11. *Urocoptis heterosculpta* Torre, sp. nov. (Holotype), 2×.
Fig. 12. *Urocoptis scalarina portuondi* Torre subsp. nov. (Holotype), 2×.
Fig. 13. *Urocoptis mellita perlonga* Torre, subsp. nov. (Holotype), 2×.
Fig. 14. *Urocoptis mellita* Torre, sp. nov. (Holotype), 2×.
Fig. 15. *Urocoptis tenuistriata* Aguayo, sp. nov. (Holotype), 2×.

Figures 6-15 by George Nelson.

WEST INDIAN MOLLUSKS NO. 3—TWO NEW SUBSPECIES OF CUBAN LIGUUS

BY W. J. CLENCH AND C. G. AGUAYO

LIGUUS FASCIATUS NOBILIS, subsp. nov. Plate 6, fig. 9.

Description: Shell solid, elongate, polished. Color, apex and columellar area deep pink, the pink of the early whorls extending through the fourth whorl. This color gradually shades into light yellow which becomes a deep lemon yellow on the last two whorls. The peripheral area of the body whorl supports a rather wide band of brown which may or may not be edged with a narrow band or between two bands of white. There are on some specimens several blue-gray flames. In addition there may be an interrupted, narrow brownish band on the upper side of this solid band of brown. This secondary

interrupted band is usually the insertion area for the axial flames. Occasionaly another interrupted band is produced along the lower edge of the suture, the main band being cut along its middle by the development of each whorl. The flames, when present, extend between these interrupted bands. Whorls 7, convex. Angle of spire acute, formed at approximately 43°. Outer lip acute though materially thickened a short distance below the edge. Parietal wall somewhat calloused. Suture slightly indented. Sculpture of only very fine growth lines.

Length	Width	Ap. length	Ap. width	
42.5 mm.	22 mm.	16 mm.	10.5 mm.	*Holotype*

Holotype: M. C. Z. No. 47904, Cayo Juan Tomas, Mouth of Cabañas Bay, Pinar del Rio Province, Cuba. C. G. Aguayo, collector, July, 1929. *Paratypes:* In the collection of C. G. Aguayo, from Cabañas Bay, Pinar del Rio, Cuba.

Remarks: This species is characterized by the presence of the brownish band at the periphery of the whorls and the lack of spiral green lines which are usually to be found in the other forms of this variable species. It differs from *Liguus fasciatus pictus* Reeve from Florida in being more elongate proportionally, in having deep pink especially on the columella which is usually absent or very pale in *F. pictus,* and in possessing the brownish unbroken band.

LIGUUS BLAINIANUS JAUMEI, subsp. nov. Plate 6, fig. 10.

Description: Shell solid, elongate, shining. Color porcelain or milk white, other than the first 2½ to 4 whorls which are pink. Only three specimens in a little less than one hundred examined by one of us had a faint, narrow peripheral green line. Whorls 7, convex, regularly increasing in size. Angle of spire acute, produced at about 43° to 46°. Aperture ovate. Lip not reflected and usually thickened within. Thinly calloused on the parietal wall. Columella straight, thick, slightly twisted and slightly truncated, pure porcelain white. Suture slightly impressed. Sculpture of numerous fine axial growth lines. Occasionally a few specimens exhibit a tendency to become slightly coarse in this

character and the growth lines become more or less grouped to form slight ridges.

Length	Width	Ap. length	Ap. width	
41 mm.	18.5 mm.	15 mm.	9 mm.	*Holotype*
41.5	19	15.5	9.5	*Paratype*
44	20	17	9.5	*Paratype*
42	19	16.5	9.5	*Paratype*

Holotype: M. C. Z. No. 91720, Mangas, on road between Mangas and Candelaria, Pinar del Rio, Cuba. W. J. Clench and P. Okkelberg, collectors, August, 1929. *Paratypes:* M. C. Z. No. 91578, same data as for holotype, also M. C. Z., collected in the same place by Dr. M. Jaume. Additional paratypes in the collection of C. G. Aguayo, M. Jaume and C. de la Torre.

Remarks: This is the first recorded *Liguus* possessing a deep pink tipped spire, that does not have this same color on the columella. It seems to be nearest in relationship to *Liguus blainianus* but differs from that species in the complete absence of color other than the pink on the spire. It differs materially in general outline from *L. fasciatus crenatus* Swain., the only other known white form from this area in Cuba. It would appear to be an albinistic form of *L. blainianus,* as is *L. f. crenatus* of *L. fasciatus.*

The area from which this form occurs is quite isolated ecologically from other Liguus-inhabited territory in the same region. Different soil conditions surround this "island" and the different flora of grass land and palms form a rather effective barrier. *L. b. jaumei* were most abundant on the royal palms.

Liguus blainianus Poey has heretofore been considered by some conchologists as a subspecies of *L. fasciatus.* It differs materially in shape from that species in having a more acute spire, a more constricted aperture and much less globose whorls. For the difference in the general character noted here, we feel that *L. blainianus* and *L. b. jaumei* should be held specifically distinct from *L. fasciatus* and the many color forms of this latter species. *L. b. jaumei* occurs in an area about 30 miles S. E. of E. from Sierra de Rangel, the type locality for *L. blainianus.*

A NEW CHITON FROM SOUTHERN CALIFORNIA

BY G. WILLETT
Los Angeles Museum

MOPALIA PEDROANA, sp. nov. Plate 7, fig. 1.

Description: Shell rather small, oval, moderately elevated, with almost straight side slopes. Head valve with eight or nine slender radial ribs, which are crossed diagonally by fine, closely-spaced riblets, with pitted interspaces: these riblets, visible only under a lens, are about forty in number, slightly curved, and run from the posterior to the anterior margin of the valve. Lateral areas set off by a faint, diagonal cord, which bears four or five tubercles: these areas are sculptured by rather poorly defined ribs, some of which are almost parallel to the diagonal cord, and others running from this cord to the posterior margin of the valve. Central areas on each side with about fifteen rows of granulose riblets with pitted inter-spaces, these riblets becoming fainter and more closely spaced toward the jugum. Beaks conspicuous. Tail valve with poorly defined mucro; sculptured with about twenty wide, somewhat curved radial ribs, which are discernible only on the posterior portion of the valve. Color of shell pink, mottled with white, in three examples, purplish in one, and dark green in another. This latter specimen has a triangular spot of white in the center of the head valve. Girdle rather wide, with sutural series of fine setae and a marginal series of still finer ones.

Type: No. 1025, collection Los Angeles Museum, collected by the writer in fifteen fathoms, off San Pedro, California, August, 1930. One additional specimen was taken in the same locality, and three more in fifteen fathoms, off South Coronado Island, Lower California, in August, 1931. *Paratype:* No. 156264, A.N.S.P.

Measurements of type in millimeters: Long., 14.6; lat., 9.6; alt., 3.4.

Remarks: The sculpture of this chiton is very different from that of any species known to the writer, with the exception of *Mopalia lignosa* Gld., which in a general way it closely

resembles. From this species it differs in smaller size, different coloration, possession of well defined diagonal riblets on all the valves, tuberculation of cords setting off lateral areas, and much finer setae on the girdle.

NOTES UPON PHILIPPINE LAND SHELLS WITH DESCRIPTIONS OF NEW FORMS

BY MAXWELL SMITH

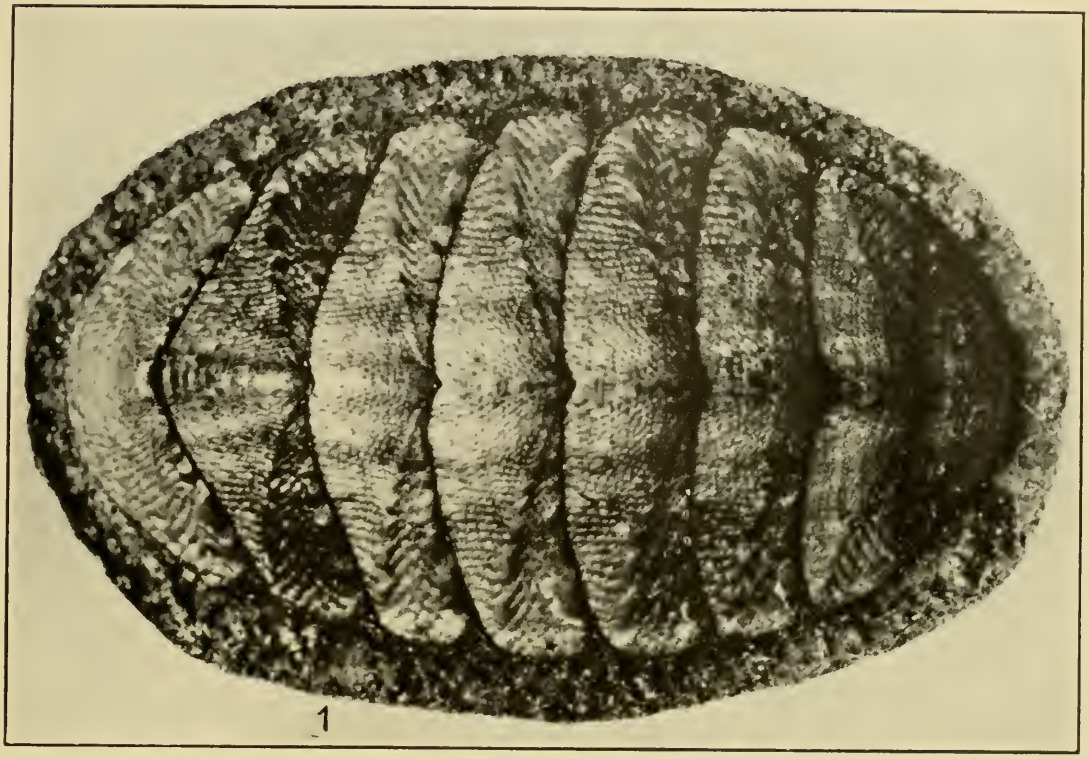
HEMIGLYPTA ILOILANA, new sp. Plate 7, fig. 2.

Shell broadly conic, with well defined peripheral keel. Three and one-half nuclear whorls yellow brown, two succeeding whorls deep flesh color and last two straw brown. The latter are characterized by an indistinct continuation of the deep flesh coloring in the form of a band a short distance below the suture. Below the white peripheral region is a strong reddish brown band. The nuclear whorls are smooth, the remainder marked by slanting incremental lines broken up by irregular spiral lines which give the surface, especially near the periphery, a reticulated appearance. The base is yellow brown, polished and clearly shows numerous growth lines; shell imperforate. The suture is moderately impressed, the last whorl excurved at the peripheral keel. Aperture broad and narrow, peristome thin above carina, moderately strong below; interior bluish white, parietal wall lightly covered with callus.

The type, in the writer's collection, is from Passi, Province of Iloilo, Island of Panay, P. I.

HELICOSTYLA TICAONICA ILOILANA, new subsp. Plate 8, fig. 6.

This race differs in being larger and more elongated than most of those found in Luzon and elsewhere. The hydrophanous cuticle is strongly marked with dark chocolate spiral bands upon the last whorl, with yellow bands and blotches upon the penultimate whorl, the darker portion extending to and forming a zone of solid color upon the parietal wall. Just below the suture the oblique streaks run straight



1. Mopalia pedroana Willett. 2. Hemiglypta iloilana Maxwell Smith.

1—5. Helicostyla decorata jarœnsis M. Smith. 6. Helicostyla ticaonica iloilana M. Smith. 7. Helicostyla fulgetrum gigantea M. Smith.

for a short distance in contrast to those which conform to the peristome.

The type is in the writer's collection. This form resembles Hidalgo's unnamed variety shown in Obras Malacologicas Plate CXXXI, fig. 7. Passi, Iloilo Province, Island of Panay, is the habitat of the new subspecies.

HELICOSTYLA DECORATA MALLEATA, new subsp.

Shell readily distinguished by its oblique impressed ridge-like growth lines upon the back of the last whorl which lean toward horizontal. These are more plainly visible to the naked eye than under a glass. Aside from the type, in a series of eighty shells, only two others show an extremely slight inclination toward malleation. Habitat Jaro, Island of Panay, P. I. This subspecies also occurs in Guimaras Island.

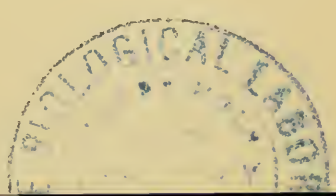
HELICOSTYLA DECORATA JAROENSIS, new subsp. Plate 8, figs. 1-5.

This protean race is unusually interesting and cannot be accounted for without an examination of the habitat. Rotund and dwarf forms appear to be in the majority. This may be explained by some decided deficiency at the habitat which results in a greatly modified environmental existence. Less than twenty-five percent of a long series before me consist of elongated shells (fig. 5) ; more than twenty-five percent are dwarfs (figs. 1, 2), the remainder being intermediate forms (figs. 3, 4).

The usually diminutive size and broad shell separate this form. Only one example shows the peripheral band of the typical decorata although a number exhibit it upon the earlier whorls. It differs from *H. decorata albolabiata* Molldf. in smaller size and narrower aperture.

HELICOSTYLA DECORATA HYBRIDA, new subsp.

The size, form and flesh colored apical region of *H. pictor* are present but the lack of persistent hydrophanous epidermis and presence of brown peripheral and sutural bands bind it to *decorata,* to which it appears most allied. It appears



advisable to put these facts on record together with the habitat, viz.: Sapian, Panay, P. I.

HELICOSTYLA FULGETRUM GIGANTEA, new. subsp. Plate 8, fig. 7.

This form differs from Broderip's type, which, incidently, is pale yellow, in being much larger, broader with more impressed suture and decidedly narrower body whorl. Whorls 7 (typical apparently only 6), with color pattern as variable as in other races of fulgetrum.

Hidalgo figures three examples of *fulgetrum* upon his Plate LXXVIII in the Obras Malacologicas. Of these fig. 3 most closely resembles this form except for its much smaller size. Upon his Plate CLXII fig. 6 illustrates a much greater development of the final whorl than in the present race.

Habitat Igbaras Mountains, Province of Iloilo, Island of Panay, P. I. Type in the writer's collection.

NOTES AND NEWS

THE STATION OF DYSNOMIA TRIQUETRA (RAFINESQUE).— In the August, 1931, issue of the Japanese conchological journal "Venus", Mr. Jiro Mariyama describes the burrowing habit of a species of the group of twisted *Arcas* comprising *A. tortuosa*, *A. semitorta* and others. The animal so lies that the entire posterior surface is in the plane of the top of the mud. Mr. Mariyama's illustration of this habit reminds me forcibly of an observation last summer. Two of us were collecting in the Elk River at Fayetteville, Tennessee. A dam had been emptied recently, leaving a flat of mud and gravel exposed to the air. In this area were a great many naiads still squeezed between pieces of gravel where they had flourished while the dam was in use and where, apparently unable to move, they had died when the water went out. Among the mollusks were female specimens of *Dysnomia triquetra*. They lay so that their truncate posterior ends were parallel with the surface of the mud. This made them difficult to see, and many times as we walked up and down the exposed bar

we picked up, or rather dug out, individuals from spots that from other angles of vision had seemed to be barren of shells. —Henry Vander Schalie.

Professor T. D. A. Cockerell writes from Pretoria that he and Mrs. Cockerell will sail from Cape Town December 1st. "We have spent days on the Lualaba River and nights on Lake Tanganyika, gone up to Lake Kivu, visited the Victoria Falls (extraordinarily beautiful), and the Zimbabwe ruins. The only good collecting for land shells was at Tshibinda, 6,000 ft., west of Lake Kivu. There are very great areas where snails are few or nearly lacking. This may be largely due to burning of the low vegetation every year, but also to the unfavorable conditions, intense dryness part of the year, and lack of limestone. We made great collections of insects."

Note on a Panamic Corbulid Clam.—Panamicorbula, new subgenus of *Corbula*. (*Potamomya* C. B. Adams, 1852, Cat. Shells Panama, p. 296, not of Sowerby, 1839.) The shell is not rostrate; the right valve is very slightly larger, with a deeply sunken chondrophore, an erect anterior cardinal tooth, and long laterals, the posterior strong, tapering towards both ends, the anterior weak. Left valve with a broad suberect chondrophore, its face bipartite, a deep socket in front of it, and no lateral teeth or sockets. Type *Potamomya inflata* C. B. Ad.

This group of rather thin, inflated Corbulidae appears to be restricted to the Panamic Province in brackish water. It is not related to the brackish or fresh water Corbulids of eastern South America (*Potamomya=Eredona*) as Prof. Adams supposed, but seems to be an independent derivative of *Corbula*, perhaps to be considered archaic in having well developed lateral teeth.

Specimens have been seen from Mazatlan and Puntarenas (Lowe), Panama (C. B. Adams, J. Zetek), Ecuador and Peru (A. A. Olsson).—H. A. Pilsbry.

The Genotype of Ampullacera Q. & G.—In Proc. Linnean Soc. N. S. Wales, vol. 25, p. 511 (1900), Hedley stated

that *Ampullarina* Sowerby was based upon (*Amphibola*) *avellana* (Gmel.), and he proposed the name *Salinator* for the Australian *A. fragilis* Lam. E. A. Smith, in the same journal for 1901, vol. 26, p. 14, suggested that as *Ampullacera* Quoy and Gaimard (1832, Voy. Astrolabe, Zool. II, 196) contained both *A. avellana* and *fragilis,* Hedley should have used that name for the latter. However, Mr. Smith did not designate *A. fragilis* as the type, so that the nomenclature is still uncertain. I would therefore designate *Ampullacera avellana* type of *Ampullacera.* The names *Amphibola* Schum., *Thallicera* Swains. and *Ampullacera* therefore are identical, all having *A. avellana* (Gmel.) as type.—PILSBRY.

ACHATINA MURREA REEVE.—In the Conch. Icon., vol. 5, 1849, Reeve figured two different color forms of *Liguus* under the name of *Achatina murrea.* His figure 22*a* is now selected as *the type.* This is a young *L. fasciatus* and probably of the typical form. His figure 22*b* has been named *L. fasciatus roseatus* by Pilsbry. This arrangement makes *A. murrea* an absolute synonym of *L. fasciatus* Müll.—W. J. CLENCH.

LIGUUS SOLIDUS DRYAS.—In revising the names of shells figured in my paper "A Study of the Variation and Zoogeography of Liguus in Florida", 1912, I noticed that *L. solidus* is represented on plate 37, fig. 1*b* by a form which would now be considered to differ enough to require a racial or form name. Typical *solidus* has the apex and columella pure white, while in this form, which I call *L. s. dryas,* these parts are rose colored, as in *L. solidus graphicus.* Typical *L. solidus* is not figured in my paper, but is defined on page 463.—H. A. PILSBRY.

CONUS AGASSIZI Dall.—This common Bermudan species has recently been synonymized with *Conus mindanus* Hwass (Proc. Malac. Soc. London, XIX, 17). On consulting the original description and figure of the latter, we are unable to concur in this opinion. None of the specimens we have seen have the "*cingulis numerosis puncticulatis*" of *mindanus,* which seems to be specifically different.—PILSBRY AND VANATTA.

PUBLICATIONS RECEIVED

LIST OF TYPES OF PELECYPODA IN THE CARNEGIE MUSEUM. List of Types of Amphineura and Gastropoda in the Carnegie Museum. By Stanley T. Brooks and Betty Watt Brooks. Ann. Carnegie Mus. Art. 6 and 7, 1931. The Carnegie Museum contains types of many species described by Hartman, Ortmann, G. H. Clapp and others, and a large number of paratypes and topotypes of other authors. The original references and localities are given in these useful lists. —H. A. P.

CATALOGUE OF THE MARINE PLIOCENE AND PLEISTOCENE MOLLUSCA OF CALIFORNIA, TOGETHER WITH A SUMMARY OF THE STRATIGRAPHIC RELATIONS OF THE FORMATIONS INVOLVED. By U. S. Grant, IV, and Hoyt Rodney Gale. (Memoirs San Diego Soc. Nat. Hist., vol. I, pp. 1-1036, pls. 1-32, Nov. 3, 1931). This beautifully executed quarto volume comes as a great surprise to many and deserves a much fuller review than time and space will permit. Part 1, pages 19-78, gives a summary of the stratigraphy. Not being familiar with the geology of the region, I can only refer to the "systematic catalogue" with its discussions of species and genera.

The new ruling (article 30) "type by subsequent designation" is causing many changes in nomenclature. If every one could agree and the rules were less conflicting, a degree of fixity could perhaps be reached, but, this happy state is still a long way off. The authors have however handled the great problem of nomenclature remarkably well. The amount of labor involved can only be appreciated by those who attempt this line of work. The changing of a genotype is often very confusing, even when the name does not change, for it often causes the raising of many subgenera to generic rank.

For Arca the type is now considered to be *A. antiqua* L. For Pecten the species *adscensionis* Osbeck 1765, has been made the genotype. Is this (originally a pre-Linnaean species) recognizable as a species? Certainly it is far from typical. I have previously criticised the use of *Volsella* Scop. in place of *Modiolus* Lam. in THE NAUTILUS, vol. 45, p. 33.

Using the family name Codakiidae instead of the more familiar Lucinidae seems unnecessary. The rules say the family name shall be based on the "name of its type genus", and does not say the oldest genus. It seems best that the rule of priority should also apply to families and as long as the genus exists the oldest family name should be used. The genotype of Lucina is now *L. pensylvanica*. There seems very little ground for taking Divaricella out of the Lucinidae. The treatment of the Cardiidae seems rather radical but is probably better than using many genera. Again I object to the use of Claviidae in place of the old and familiar Cerithiidae, because *Clava* Martyn happens to be five years older than Cerithium, especially since the binominal standing and method of publication of Martyn's work is questioned.

I approve of the authors' treatment of Neptunea Bolten, but am wondering if anything is gained by making the group a family. Its relation to Fasciolariidae on the one hand and Buccinidae on the other, often makes it difficult to define. Colus seems like a good genus as genera go. Every one will be glad to return so near to the genus Nassa as Nassarius Dumeril, 1805, family Nassaridae, genotype *N. arcularia*. The Pyrene-Columbella matter is handled very justly. Mitrella Risso 1826 is used in place of Astyris H. and A. Ads. 1853. The position in which the genus Thais is placed in the family Muricidae seems rather startling. It seems to warrant at least the rank of a subfamily. A new subgenus—MURITHAIS is proposed for *Murex trunculus* L.

The illustrations are excellent. This great work is of more value to the conchologists than to most of the paleontologists and the authors deserve the highest commendation for producing such a valuable work in these days of nomenclatorial chaos.—C. W. JOHNSON.

THE NAUTILUS.

Vol. XLV APRIL, 1932. No. 4

SOME NOTES ON THE NEW ENGLAND SPECIES OF TELLINA

BY CHARLES W. JOHNSON

No doubt many like myself have been at a loss to separate *Tellina tenella* Verr. from *Tellina tenera* Say, especially if they have attempted to use the figures given by Verrill. In 1872 Verrill[1] described and figured a species under the name of *Angulus modestus*. The name being preoccupied it was changed by Verrill to *Angulus tenellus* in 1873[2]. Recognizing Angulus as a genus Verrill also changed *tenera* to *tener*. It is certainly at most, only a subgenus. Dall in 1900[3] says:—"The name *tenella* has been used earlier in Tellina but I have lost the reference." I have been unable to find a species *T. tenella* prior to 1873; perhaps Dr. Dall had in mind *Tellina tenella* Jeffreys 1881[4], described from C. Sagres, Portugal, a very different shell, for which the new name TELLINA JEFFREYSI is here proposed.

The question of *Tellina tenella* was recently called to my attention by Mr. J. Henry Blake who brought to the Museum his entire New England collection of the genus, including some specimens of *T. tenella* determined by Verrill. One specimen, the first that I have seen agreeing perfectly with the one figured by Verrill, represents a specimen that is far from what should be considered typical of the species. The form of the shell is abnormal and the irregular growth lines are due to erosion. A perfect specimen has the dorsal margin straight and not "slightly concave" and is smooth with fine, regular concentric lines.

[1] Amer. Jour. Sci. and Arts, vol. 3, ser. 3, p. 285, pl. 6.
[2] Invert. Animals of Vineyard Sound, p. 677, pl. 30, fig. 224.
[3] Proc. U. S. Nat. Mus., vol. 23, p. 295.
[4] Proc. Zool. Soc. London, 1881, p. 721, pl. 51, fig. 4.

The two species are quite readily separated, *T. tenera* being much higher and the lower edge of the valves more arcuate. It measures from 8 to 10 mm. in height and from 12 to 15 mm. in length. The largest specimen of *T. tenella* before me is 7 mm. in height and 12 mm. in length. The color of the two species varies from white to pinkish. In *tenella* the periostracum is often thicker than in *tenera*, giving the shell a yellowish appearance. The teeth of the hinge are more equal in size in *tenella* than in *tenera*.

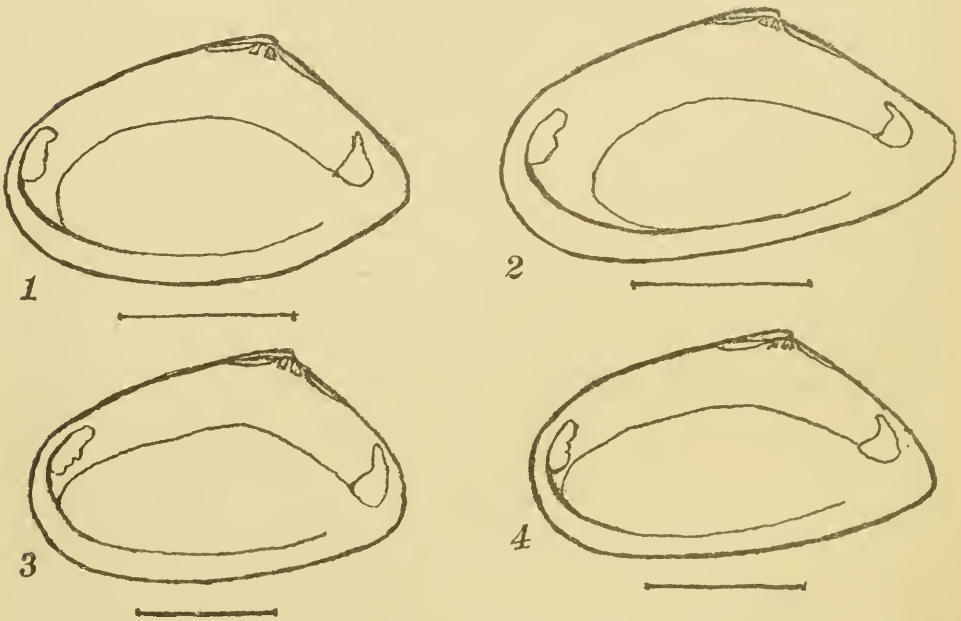


Fig. 1. *Tellina (Angulus) tenera* Say. Fig. 2. *Macoma tenta* Say. Fig. 3. *Tellina (Angulus) tenella* Verrill. Fig. 4. *Tellina (Angulus) versicolor* (Cozzens) DeKay.

The figure that is apt to mislead a student is that given on Verrill's plate 6 figure 1, showing what is said to be the pallial line of *T. tenera*. Say does not mention this character, but Gould says, "sinus of the pallial impression nearly reaching the anterior muscular impression." An examination of all specimens referable to *T. tenera* shows that the distance between the pallial line and the adductor muscle scar is less than the width of the muscle scar; while Verrill's figure shows the distance to be more than double. It was rather puzzling at first, until I happened to glance

at *Macoma tenta* Say and found that here was the exact proportion shown in his figure 1. One can only conclude that after drawing the outline of *T. tenera* he inadvertently picked up a specimen of *M. tenta* to draw the pallial line. His figure (2) of *T. tenella* is correct, the distance between the pallial line and muscle scar being a little narrower than in *T. tenera.*

The distribution of *T. tenera* is from Prince Edward Island to the Gulf of Mexico. It is the *Tellina elucens* Mighels 1844, *T. agilis* Stimpson 1857, and *T. omoia* Ravenel 1875. *Tellina tenella* seems to be confined chiefly to the waters of southern Massachusetts, Rhode Island, and Long Island Sound. Arthur P. Jacot records it from Long Beach and Staten Island, N. Y. Dall in referring to *tenella* says: "The shell referred to this species from Tampa, Florida, by me, appears on further study to be distinct."

Tellina versicolor was only recorded by Cozzens in 1836[1] and later described by DeKay in 1843[2]. According to DeKay the species was "first detected by Mr. I. Cozzens on the shores of the Hudson at Glass-house point, a few miles above the city." Just what part of the present city of New York this locality would now represent I am unable to say, but the fact would now be of little value as far as the species is concerned. Fortunately we are able to positively identify this beautiful little shell which stands quite distinct among the small tellinas. The figures by DeKay are poor, giving the impression that the shell is much higher than it really is. The description and measurements, however, agree with specimens now to be found in favorable localities near New York City. Some beautiful specimens collected at Far Rockaway, N. Y., were sent to the Museum by Mr. Arthur P. Jacot, he also obtained some specimens at Long Beach, N. Y. The color is an opalescent white usually with rays of pink that widen toward the margin. The pallial line is very close to the adductor muscle scar. Length of the largest specimen before me is 14 mm., height 8 mm.

[1] In Jay's Catl. Shells, ed. 2, p. 12.
[2] Natural Hist. N. Y. Moll., p. 209, pl. 26, fig. 172.

THOMAS SAY—HIS FIRST PAPER ON AMERICAN MOLLUSKS

BY W. J. CLENCH

The first paper published by Thomas Say on Mollusks appeared under the caption of *Conchology* in "The First American Edition of the British Encyclopedia or Dictionary of Arts and Sciences" by William Nicholson, published by Samuel A. Mitchell and Horace Ames, Philadelphia, 1816. The article appeared in Volume 4, and covered from p. 8 to p. 21 (pages not numbered, however), accompanied by 4 plates all drawn by Say. Six pages are devoted to a general discussion on shells in general with references to various characters by which they are differentiated and notes on shell structure. The remaining eight and one-half pages are given over to the descriptions of our common east American forms.

The volume is marked on the book as Volume 4. The fly-leaf carries a characteristic method of indicating the volume by punching out four small stars. The end of the volume reads "End of Volume II". It would appear from this that a change of policy took place after the series was published—by doubling the number of volumes, each one would be less bulky. Another point that bears this out is that Vol. I (half of the original Vol. I) ends in the middle of a sentence while Vol. IV (the last half of the original Vol. II) is completed to the end of a definition. In addition Vol. I states "Vol. I A...B" but only covers completely to "Areometer". I obtained only two volumes of this set in a Washington secondhand book store several years ago. The original set was broken up and it was fortunate that both the first and the fourth volumes were among the remainder, the first for the title page and the fourth for Say's article. Many citations for this work are dated 1817 in error. A second edition appeared in 1818 and a third in 1819 (cf. Binney, Bibliography of American Conchology, 1863, pp. 254-256). Binney didn't see the first ed. (1816) but quoted the reference as supplied by Mr. S. Hanley. His listing of Say's species in error as from Vol. II was due in all probability to the change in volume binding as described above.

ON FOUR NEW SPECIES OF EPITONIUM FROM WESTERN CENTRAL AMERICA

BY HERBERT N. LOWE

During the Spring of 1931 the writer collected a fine species of *Epitonium* from Montijo Bay, Panama. This is the largest reported thus far from the Panama region and appears to be quite distinct from any described species; it is not represented in either the national collection or that of the Philadelphia Academy. While dredging at San Juan del Sur, Nicaragua, two apparently new species of *Nodiscala* were taken, descriptions and figures of which appear in this paper, with a *Nitidiscala* obtained in the Gulf of Fonseca. Illustrations of three of Dr. Dall's unfigured species are given; these specimens having been compared with the types in the National Museum.

EPITONIUM (ASPEROSCALA) CANNA Dall. Pl. 9, figs. 7, 8.
Proc. U. S. N. M., vol. 56, page 341.

From Magdalena Bay. Described as a shell of six varices and six whorls exclusive of the lost nucleus. Alt. 9 mm., diam. 5 mm. Our specimens were dredged at Mazatlan. The smaller specimen tallies exactly with the unique type specimen. A second much larger shell measures 16.5 mm. alt. by 6 mm. diam., a few spiral striae on base of each whorl.

EPITONIUM (ASPEROSCALA) TINCTORIUM Dall. Pl. 9, fig. 6.
Proc. U. S. N. M., vol. 56, page 340.

From Magdalena Bay, has eleven to twelve varices and six or more whorls exclusive of the lost nucleus, uniformly finely spirally striate; a narrow purple brown band in front of the suture. Alt. 7 mm., diam. 3 mm. Our shell was taken at Montijo Bay and measures, alt. 5.5 mm., diam. 27 mm., with six whorls and two nuclear whorls; eleven varices. It plainly shows the dark band at suture.

EPITONIUM (NITIDISCALA) PHANIUM Dall. Pl. 9, fig. 2.
Proc. U. S. N. M., vol. 56, page 341.

From Magdalena Bay. Eight whorls including two nu-

clear, seven or eight continuous varices without angles or spines. Alt. 8 mm., diam. 4 mm. Our specimen is from Montijo Bay. Alt. 5.2 mm., diam. 23 mm., light varices, nine whorls including two nuclear.

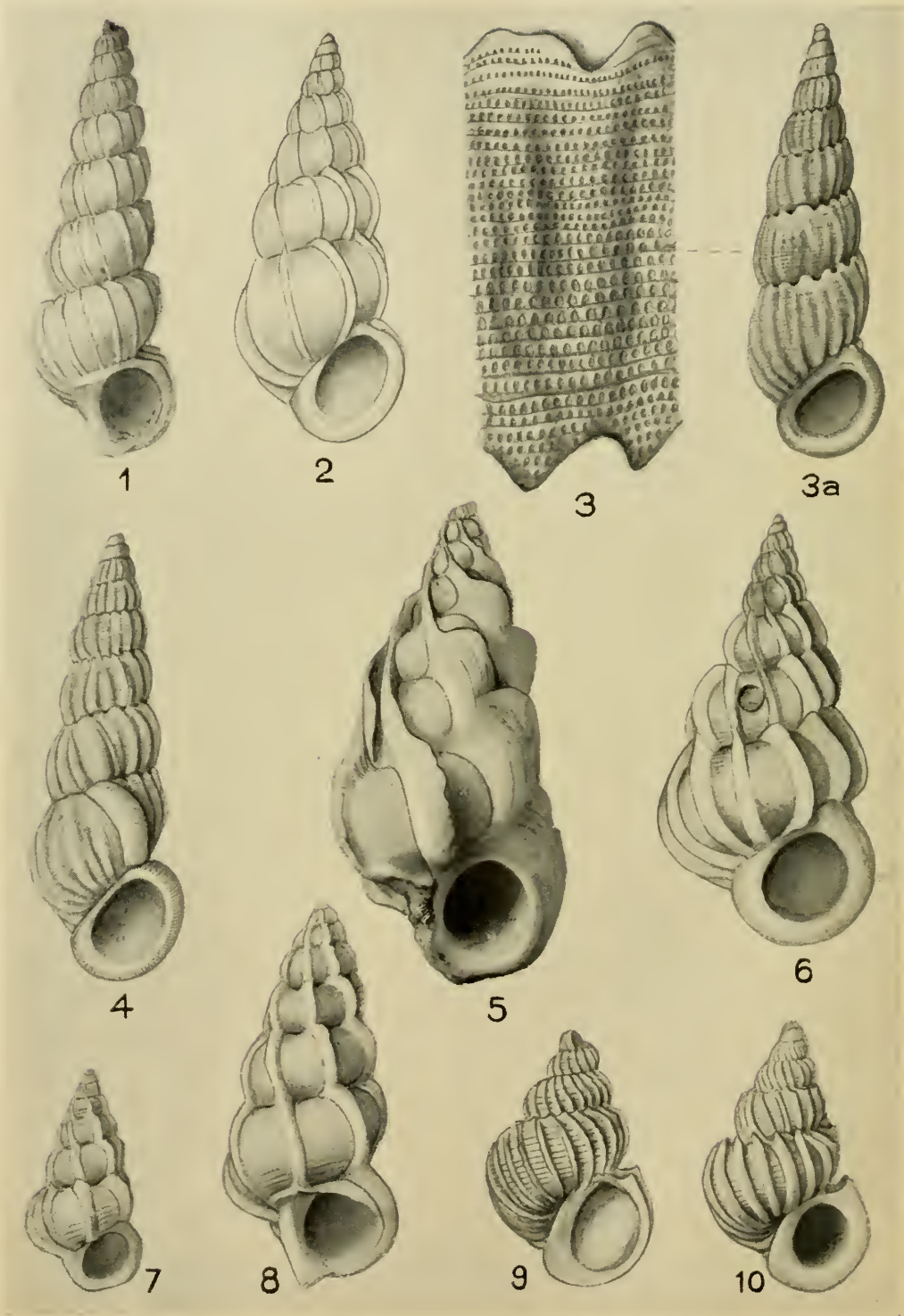
EPITONIUM (NITIDISCALA) GAYLORDIANUM, new species. Pl. 9, fig. 1. Montijo Bay, Panama (Lowe), Type 157987 ANSP. Paratypes: Lowe collection.

Shell large for the genus, solid, with seven well rounded whorls with about three or four earlier whorls missing. Suture deeply impressed. There are twelve to fourteen stout, smooth, slightly reflected varices to the whorl, inclined to angularity just below the suture, not continuous up the spire. There is a trace of very indistinct spiral incised lines. Base well rounded, aperture ovate, slightly effuse below; basal lip and parietal wall with a broad callus, reflected above. Outer lip with a strong varix. Alt. 28.5 mm., diam. 9.5 mm. This is one of the largest species of the genus reported from the west coast, and is named in honor of Ilsien Nathalie Gaylord who has done much nature writing for children.

EPITONIUM (NODISCALA) ORDENAÑUM, new species. Pl. 9, figs. 3, 3 *a*. San Juan del Sur, dredged 20 fathoms. Nicaragua (Lowe). Type 157988 ANSP.

Shell small, milk white, elongate conic, evenly covered over the entire surface with fine spiral, punctate incised lines. Nine rather flat whorls with well defined suture. Fifteen conspicuous rounded ribs, which have a tendency to coalesce at the suture and lap over the edge of preceding whorl making a coronate effect at the suture. Aperture oval, with strong, much thickened varix. Alt. 7 mm., diam. 2 mm. This shell is much slimmer, and has flatter whorls, than *E. sanjuanense,* and while having the same number of whorls it is only about two-thirds the size. There are also three more ribs to the whorl.

This species is named for Senor Ordeñana, Comandante at San Juan, at whose home I stayed during my two weeks' sojourn there.



Lowe: Epitonium

EPITONIUM (NODISCALA) SANJUANENSE, new species. Pl. 9, fig. 4. San Juan del Sur, Nicaragua. Type 157989 ANSP. (Dredged 20 fath. Lowe.)

Shell small, milk white, elongate conic, of nine well rounded whorls, evenly covered over entire surface with faint spiral, punctate incised lines. Suture well defined. There are twelve prominent rounded ribs. Aperture oval with strong, much thickened varix. On each of the two preceding whorls is an equally strong varix. Alt. 10.5 mm., diam. 3.5 mm.

Operculum dark brown, pancispiral with nearly basal nucleus, lightly marked with growth wrinkles.

EPITONIUM (NITIDISCALA) STRONGI, new species. Pl. 9, fig. 5. La Union, Gulf of Fonseca, San Salvador (Lowe, 1931). Type 155535 ANSP.

A species of rather stout figure, having five varices, continuous from whorl to whorl, ascending the spire spirally, making about one turn around it. The varices are very broad and strongly recurved. Intervals smoothish, glossy, showing faint traces of spiral scratches in places, and with a rather weak thread defining the base. The apex is lost, seven strongly convex but compactly united whorls remaining. Aperture shortly oval. Length 19 mm., diam. 9.1 mm.

The broad, recurved varices characterize this fine species, which is named in honor of one of our keenest workers on west coast mollusks.

MOLLUSKS IN THE VICINITY OF YANKTON, SOUTH DAKOTA

BY DAVID T. JONES
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The following collections were all made by the author in the summer of 1925, while teaching at Yankton College, but the material was not examined or classified until recently at

Marietta College, Marietta, Ohio. All shells, unless otherwise stated are in a subfossil condition. The cornfield in Cedar County, Nebraska, many years ago was a bed of the Missouri River, and still is overflowed. It is opposite Yankton, between the Nebraska bluffs and the Yankton bridge, within walking distance of Yankton. Cedar Bluffs, the mouth of the James River (locally, the "Jim"), Sisters Grove, Chalkstone Cave, and Smutty Bear's land are all on the South Dakota side, the last three being up the river from Yankton. Smutty Bear's land was visited in company with A. W. Westhorpe, late archeologist of Yankton, on a collecting trip for Indian flints and hammers. It is a plain along the Missouri, somewhere near Lakeport, and is the former hunting ground of Smutty Bear, a banished renegade of Chief Strike-the-Ree's Yankton Indians. All other localities are common local names.

Vallonia parvula Sterki. Hills west of Sisters Grove and Chalkstone Cave, several, some apparently recent; mouth of James River, a few; ditch flowing through cornfield into Kaiser Creek, Cedar Co., Neb., one subfossil; Cedar Bluffs, two subfossils.

Vallonia gracilicosta Reinh. Hills west of Sisters Grove and Chalkstone Cave, three juvenile subfossils; mouth of James River, four subfossils.

Polygyra monodon (Rackett). Near Yankton bridge across Missouri River on Dakota side, one; hills west of Sisters Grove, a few; bluffs of Cedar Co., Neb., a few; Smutty Bear's land, many, subfossil and recent; mouth of James River, one.

Gastrocopta armifera (Say). Hills west of Sisters Grove and Chalkstone Cave, fifteen specimens, some recent; mouth of James River, many; subfossil and recent; bluffs of Cedar Co., Neb., three specimens, recent.

Gastrocopta contracta (Say). Hills west of Sisters Grove and Chalkstone Cave, three; mouth of James River, three.

Gastrocopta holzingeri (Sterki). Hills west of Sisters Grove and Chalkstone Cave, four.

Gastrocopta procera (Gould). Mouth of James River, six specimens.

Pupilla syngenes dextroversa (P. & V.) Hills west of Sisters Grove and Chalkstone Cave, one specimen, subfossil. Like the Montana record of *syngenes,* this is "far from home". The shell checks nicely with specimens from Zion National Park, Utah, in regard to size and shape, though the aperture is plugged up, and the outer lip of the Dakota shell has a *Vertigo*-like sinuous curve, which is lacking in the Utah specimens. The Dakota shell is faded as are the other subfossils with which it occurs.

Vertigo ovata Say. Cornfield, Cedar Co., Neb., one, subfossil.

Retinella hammonis (Strom). Mouth of James River, one.

Zonitoides arboreus Say. Hill west of Sisters Grove and Chalkstone Cave, two; mouth of the James River, two; bluffs of Cedar Co., Neb., one.

Hawaia minuscula (Binney). Hills west of Sisters Grove and Chalkstone Cave, six, probably recent; near Yankton bridge on Dakota side, one; mouth of James River, eight.

Anguispira alternata (Say). Smutty Bear's land, many, subfossil, but with color markings faintly showing. Some very high-spired.

Helicodiscus parallelus (Say). Hills west of Sisters Grove and Chalkstone Cave, six; some living; cornfield, Cedar Co., Neb., several; mouth of James River, many; Nebraska bluffs of Cedar Co., four; Cedar Bluffs, four.

Succinea avara Say. Cornfield, Cedar Co., Neb., many.

Succinea ovalis Say. Smutty Bear's land, one.

Succinea haydeni Binney. Cornfield, Cedar Co., Neb., one, subfossil.

Stagnicola palustris elodes (Say). Cornfield, Cedar Co., Neb., many; Cedar Bluffs, one juvenile.

Stagnicola caperata (Say). Cornfield, Cedar Co., Neb., many; near Yankton bridge on Dakota side, one.

Fossaria modicella (Say). Cornfield, Cedar Co., Neb., a few; near Yankton bridge on the Dakota side, one juvenile; Cedar Bluffs, one juvenile.

Fossaria obrussa (Say). Cedar Bluffs, one.

Helisoma trivolvis (Say). Cornfield, Cedar Co., Neb., many.

Planorbula armigera (Say). Cedar Bluffs, one adult subfossil, also one juvenile.

Gyraulus parvus (Say). Hills west of Sisters Grove and Chalkstone Cave, three juvenile subfossils; cornfield, Cedar Co., Neb., several, mostly juvenile subfossils; Missouri River, near bridge, Yankton side, two; mouth of James River, two.

Gyraulus altissimus (F. C. Baker). Cedar Bluffs, one; species questioned.

Gyraulus umbilicatellus (Cockerell). Cedar Bluffs, one, apparently recent.

Physa gyrina Say. Marne Creek in city of Yankton, many, living; cornfield, Cedar Co., Neb., many, subfossil.

Valvata tricarinata Say. Cedar Bluffs, one juvenile subfossil.

Cincinnatia cincinnatiensis (Anthony). Mouth of the James River, two; Cedar Bluffs, several.

Amnicola limosa (Say). Mouth of the James River, one; Cedar Bluffs, many.

Sphaerium striatinum (Lam.). Marne Creek in city of Yankton, several, living.

Users of this list may also wish to consult W. H. Over's lists of South Dakota mollusks in THE NAUTILUS, Vol. XXIX, 1915, and in Vol. XLI, 1928; also Junius Henderson's list in THE NAUTILUS, Vol. XLI, 1927. None of these lists, however, have records from Yankton County or the adjacent Nebraska region. The study of these Yankton shells has been especially interesting, as in this fauna eastern and western forms are intermingled.

A PROTEST AGAINST THE USE OF "NAVICULA" FOR A GROUP OF MOLLUSCA

BY G. D. HANNA

The use of the name *"Navicula"* in place of the century-old *"Arca"* was apparently first advocated by L. R. Cox in

1927, acting upon a suggestion by Mr. J. R. le B. Tomlin. The problem has also been considered by Ralph B. Stewart, 1930, and J. Marwick, 1931. Dr. Stewart expected that the rules of nomenclature which apparently make the change necessary might be waived in this instance and it is hoped that that suggestion will be acted upon favorably.

The process of displacing the long accepted definition of *Arca* is somewhat complicated and rests upon that fruitful source of trouble, the designation of type species of superspecific groups.

It seems probable that other interpretations may be possible on the evidence thus far presented and there is no certain assurance that all of the pertinent facts have been gathered together for the case. Even so, there is some reason to doubt that the use of the name *Arca* for the last hundred years is completely invalid. I do not propose to discuss this phase of the subject further at present because my protest against the substitution of *"Navicula"* for the molluscan group is based upon other reasoning.

The largest and most common group of diatoms is known as *"Navicula"* the world over. A conservative estimate of the number of species is well over 1,000. Originally they were called "oat animals" because of the fancied resemblance of individuals to grains of oats. The genus dates from Bory de Saint-Vincent, 1822, and has *Navicula ostrearia* Bory for type species.

These organisms were considered to belong to the animal kingdom at the time the name was proposed and for many years afterwards. Even now some competent biologists believe the diatoms are a little closer to the animal kingdom than to the plants. Certain it is, they are in the border zone between the two and may be shifted back and forth indefinitely.

The use of the name *"Navicula"* for *"Arca"* will certainly promote great confusion. Much of the food of the *Navicula* ark consists of the *Navicula* diatom. The writer of an ecological paper would find it very embarrassing to be forced to make such a statement as: "One of the chief constituents in

the food of *Navicula multicostata* [the mollusk] is *Navicula multicostata* [the diatom]." A great many specific names are duplicated in the two groups.

In paleontology both organisms are often found in the same strata and reports are already in progress where it is necessary to list diatoms belonging to *Navicula* and shells which will be *"Navicula"* if the proposed substitution be accepted.

It is true that the rules of nomenclature now permit the duplication of genus-names in botany and zoology but at the time Blainville (1824) proposed *Navicula* for a group of mollusks that name was definitely invalid. The diatom genus, *Navicula* was already in use and the foremost biologists of the time considered the members of the group to be animals and so considered them for many years thereafter. Therefore, Blainville's *"Navicula"* was a homonym in scientific circles for 50 years and it only ceased to be with the gradual transfer of the diatoms to the realm of botany. Whether they will always remain so placed cannot be answered at this time. In view of the doubt it would seem to be desirable to avoid confusion if possible.

It is earnestly requested that students hold the substitution of *Navicula* for *Arca* in abeyance temporarily with the hope that the International Commission of Zoological Nomenclature may see its way clear to suspend any rules which may be necessary in order to declare *Arca* a *nomen conservendum*.

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THE RELATION OF TEMPERATURE TO CONTINUOUS REPRODUCTION IN THE PULMONATE SNAIL, PHYSA GYRINA SAY

BY DR. H. P. KJERSCHOW AGERSBORG
Atlantic University, Virginia Beach, Va.

Waste water from a corn products manufacturing plant at Decatur, Illinois, having a temperature from 28° to 35° C., provided continuously all the year a highly favorable medium for the fresh-water pulmonate, *Physa gyrina* Say. The temperature was practically constant during all ordinary workdays, including Sundays, for the entire year. In winter, when the temperature of the air was —10° C., that of the waste water ditch was still between 28° and 35° C.

The constant, high temperature of the waste water, with a certain amount of organic matter in solution, furthered the growth of fission fungi (*Sphaerotilus natans, Clonothrix, Beggiatoa rustica,* and their allies) ; these bacteria developed in enormous masses in the ditch, forming a black and putrescent sludge bed over a foot in depth. On the top of the sludge bed, and around the edges of the stream was a continuous mat of *Sphaerotilus* and related species, mixed with the slime algae, *Oscillatoria prolifica* and *O. limosa.* Upon this flora, *Physa* sustained itself. It grew and reproduced, even in the middle of winter.

In fact, this mollusc occurred in countless numbers, in solid masses covering the banks and bottom of the entire ditch for nearly a mile. It occurred as far up in the ditch to within the range of 33° C. (the temperature decreased farther and farther down the ditch).

Masses of nidosomes were deposited on the back of individual snails, on twigs projecting over the water, slightly touching it, on pebbles and stones along the sides of the stream—on every solid particle of the substrate. These situations provided more or less permanent positions for the nidosomes during the embryonic development. The top of the sludge bed was not satisfactory for this purpose. Nidosomes deposited on the back of individual snails, thereby being carried about from place to place during the embryonic

development, evidently had been lodged in the most suitable situation.

I found only one embryo in each egg capsule. Many capsules were without any eggs.

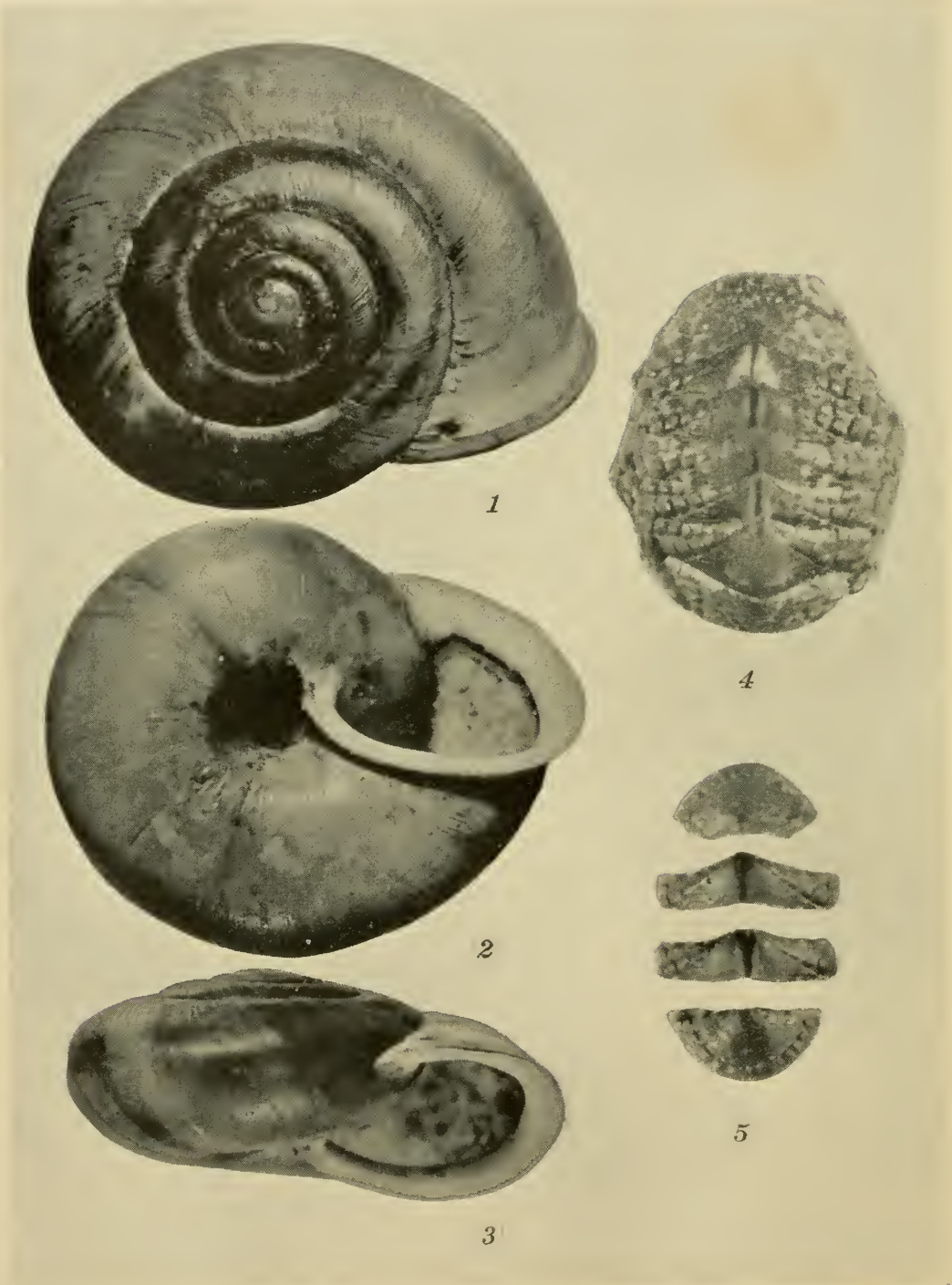
Occasionally, when the work at the manufacturing plant was shut down, and the snail was subjected to the regular season's temperature, there was a great mortality amongst the snail population. Some snails buried in the surface layer of the sludge bed, which, owing to decomposition going on there, was of a higher temperature than the cold lake water. When the plant resumed operation and warm water had been flowing down the ditch for a few days, the snails occurred again seemingly as abundantly as before the cold water bath.

The shell of this snail was so thin and brittle that it was difficult to handle the shell without breaking it. This condition of the shell was probably due to the nature of the food upon which the snail was living; the amount of calcium in the water was about the same as that found in Lake Michigan, *e.g.*, between 27.9 and 33.0 in parts per million.

A complete chemical analysis of the water from typical snail beds, taken on the 5 and the 13 of February, 1929, snail beds, taken on the 5th and the 13th of February, 1929, show the water contained the following:[1]

February 5, 1929		February 13, 1929	
Turbidity	40.	Turbidity	5.
Sediment, Gray shreds (S. natans)		Sediment, Gray shreds (S. natans)	
Odor	Faint earthy	Odor	Faint earthy
Residue on evaporation	341.	Residue on evaporation	342.
Loss on ignition	103.	Loss on ignition	92.
Suspended solids	26.	Suspended solids	17.
Free ammonia	0,	Free ammonia	0.
Organic nitrogen	1.36	Organic nitrogen	0.76
Nitrites	0.024	Nitrites	0.075
Nitrates	0.3	Nitrates	0.9
Oxygen consumed	14.0	Oxygen consumed	12.8
Chlorides	13.	Chlorides	10.
Alkalinity	165.	Alkalinity	205.
Dissolved oxygen	5.7	Dissolved oxygen	5.5
Biological oxygen demand (five days)	15.1	Biological oxygen demand (five days)	15.4
Calcium	33.0	Calcium	27.9

[1] I am indebted to Engineer W. J. Downer and the Chemist C. C. Larson of the State Department of Public Health, Division of Sanitary Engineering (Springfield, Illinois) for collecting the samples of water and making the chemical analyses, respectively.



1—3. Polygyra clenchi Rehder, 3x. 4, 5. Chiton miltoplax Rehder, 9x.

The chemical data of the above table show that the water, in which this snail thrived so wonderfully well, was semi-polluted. What chemical substances that were the accountable factors for the thin, brittle shell remains an open question. I suggested that the food itself, the fungi (*S. natans, et al.*) were responsible for the abnormal nature of the shell. Another factor, perhaps, was the high temperature of the water which promoted a rapid devolpment and a rapid succession of generations, so that there was not enough time for the building up of a normal shell. Still another factor might be the absence of enemies. There was seemingly no particular selective principle in operation promoting the survival of the more fit. On the sea coast [2] where only thick-shelled snails occurred in the exposed places, and thin- and thick-shelled individuals occurred side by side in sheltered places, *e.g.*, under the docks, there was evidently a selective principle in operation. In the case of *Physa gyrina* Say, which lived in the starch-waste water ditch, all had an equal chance for development and propagation. So that this thin shelled condition was probably relative and not absolute in nature. A more thorough study of this phase of this problem is necessary to settle this point.

This variety of thin-shelled snails is descended from the ordinary pond snail, *P. gyrina,* very common in ponds and streams in Illinois, which had migrated into the warm starch-waste water ditch from nearby waters or moist meadows. The ditch was established in 1923. Judging by the great number of individuals present in the ditch, this snail, seemingly, did not have any enemies which preyed upon it in this particular situation.

From the above it is seen that if food and temperature comparable to summer conditions continue through winter in northern climate, a fresh water snail that normally would hibernate during the coldest part of the year will project its summer activities and reproduce its kind at maximum rate throughout the entire year.

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[2] H .P. K. Agersborg (1929). Factors in the evolution of the Prosobranchiate mollusc *Purpara lapillus.* Nautilus 43:45-49.

A MISIDENTIFIED LOWER CALIFORNIAN SNAIL

BY H. A. PILSBRY

MANGELIA FREDBAKERI, new species. Pl. 11, fig. 11. San Hippolite Point, Lower California, collected by Henry Hemphill. Type and paratype: 46059 ANSP.; others 113849.

The shell is solid, fusiform, white with brown spots on part of the axial ribs above the periphery and on the basal slope, where they more or less coalesce into spiral bands; wanting in the peripheral region. First two whorls smooth;[1] two spirals then appear, and on the third whorl three spiral cords and weak axial ribs. The last whorl has ten rounded axial ribs about equal to their intervals and 11 or 12 strong spiral cords, of which five are above the periphery. On the face of the penult whorl are four cords. The oblong aperture is slightly narrowed at the anterior end, and has a distinct sinus at the upper end of the outer lip, which is very little retracted there. Anterior to the sinus the outer lip has two low tubercles. The slightly sinuous inner margin of the aperture is plain. Length 4.5 mm., diam. 1.9 mm.

This species has been known in collections as *Pleurotoma* or *Clathurella lineolata* Reeve. It is presumably the "*Mangilia lineolata* Reeve" of Bull. 112, U. S. Nat. Mus., p. 82 (exclusive of reference), but so far as I know our shell has never been described. Mr. le Brocton Tomlin, who kindly compared specimens for me with the type of *P. lineolata* in the British Museum, writes as follows: "Your Lower Californian turrid is not the least like *Pleurotoma lineolata* Reeve. I found the type (ex coll. Gray) without any difficulty. It is an elongate, narrow shell with longish, narrow aperture and somewhat obscurely banded, altogether of a usual palaearctic type of *Mangelia*. I have but little doubt that it is identical with *M. multilineolata* (Desh.) of the Mediterranean."

The generic reference of our Lower Californian snail is

[1] Described from a young paratype; all specimens are somewhat worn, and in the type and other adult shells one or more whorls are lacking.

provisional. It is one of those forms with both columbellid and turrid shell characters, but temporarily referred to the genus *Mangelia* of authors. Named for an old friend, the author of valuable papers on the Lower Californian fauna.

THE GENUS ARMSIA

BY C. MONTAGUE COOKE, JR.

ARMSIA Pilsbry, 1911 (Manual of Conchology 21, p. 132, type *Pterodiscus petasus* Ancey), a monotypic genus, was placed by Pilsbry after *Planamastra* with the following note: "While evidently related to *Planamastra, Armsia* has been diversely differentiated, and probably represents a parallel phylum derived from the same amastrine stock before the spire had become flat."

Armsia petasus is to be considered a rare shell, since during the last twenty-nine years material has come into the Museum's collection from only eighteen colonies, eight of which were from the small valley of Pukaloa. Most of this material, which is limited to the Waianae Mountain Range, was collected either by Spalding or Cooke. Additional material has come from Thaanum, Meinecke, and Oswald. The large majority of the specimens were found "dead".

None of the Museum's specimens were collected south of the Pohakea Pass. The Museum has specimens from Kanehoa, Popouwela, Pukaloa, and Haleauau on the eastern side of the range, Mokuleia on the northern side, and Makaha and Waianae valleys on the western side.

From the much more abundant material at my disposal than Dr. Pilsbry had, I have reached somewhat different conclusions as to the position of this genus.

The embryonic whorls, as mentioned by Pilsbry, are distinct from those of *Pterodiscus* and *Planamastra*. Comparison with embryos of other Amastridae shows that they are unlike the typical flattened embryos of any Amastrini, but are almost identical with the embryos of the species of *Leptachatina* placed in the subgenus *Thaanumia*.[1]

[1] Manual of Conchology, 21, p. 82, 1911.

A comparison of the embryos of *Leptachatina, Thaanumia,* and *Armsia* shows that the embryos of some of the species included in *Thaanumia* and *Armsia* are almost identical. The characteristic flattening of the embryonic whorls separated by a rather deep suture does not occur in any species of *Leptachatina* in the restricted sense. The characteristic costae of *Armsia* are alike in some Leptachatinas and all the species of subgenera *Thaanumia* and *Ilikala.* A less important character, but one that may be of some significance, is that none of the Leptachatini (including *Armsia*) are even distinctly agglutinated, while many species of *Amastra,* most of the species of the subgenus *Cyclamastra,* and all the species of *Pterodiscus* and *Planamastra* are more or less heavily agglutinated when collected alive.

The animals of several adult specimens were opened with the hope that embryos would be found, but none were pregnant. In a similar number of adult Amastrini, a number would have contained embryos, no matter at what season of the year they were collected.

Unfortunately, only a few very young specimens of *Armsia* are in the Museum's collection. The youngest of these (93388) has two and a half whorls and is nearly 2 mm. in diameter; the next had from three to three and a half whorls, and in none of these is there any indication of a columellar fold, neither is there any indication of radial striation on the embryonic whorls, although the spiral striae are distinct under a lens.

With this evidence, it seems that *Armsia* should be placed in the group Leptachatini next to the subgenus *Thaanumia.* It should be considered of generic rank, separated from *Leptachatina* by the absence of a columellar fold, its very broad umbilicus, and its sharply angulate periphery. It is the only known leptachatinid assuming the helicoid shape.

Armsia bears the same relationship to the subgenus *Thaanumia* of *Leptachatina,* as *Planamastra* to the subgenus *Cyclamastra* of *Amastra.*

NOTES ON ACAR GRAY

BY U. S. GRANT
University of California at Los Angeles

In a recent interesting paper[1] Dr. Bartsch discussed briefly some west American species of *Acar,* proposed two new ones and elevated *Acar* to full generic standing. While the taxonomic value which should be given to superspecific group names must, unfortunately, be largely a matter of personal opinion, I regret the modern tendency to elevate most of the group names which have been considered of sectional significance to full generic standing. Perhaps *Acar* should be considered a distinct genus, but would it not be just as well to look upon it as a reticulated subgenus of *Barbatia,* with somewhat different shape and muscle scars? Little seems to be gained in placing too much emphasis on minor subdivisions other than adding to the complexity of an already sufficiently esoteric science. In some cases the phylogenetic history of a group of species or of a combination of shell characters (sometimes brought to light by paleontologic research) will give some basis for judging the taxonomic value of a group name, for if certain distinctive group characters can be discovered to have considerable antiquity then the presumption might be that the group is well established and has had time to thoroughly establish its separate existence. For example *Acila* dates back at least to the Cretaceous and might well be considered a genus distinct from *Nucula* from which it certainly sprung in the Mesozoic. I do not know the geologic range of *Acar,* but if it began in the Miocene, whose faunas are distinctly more modern than and different from those of even the Oligocene, I should be inclined to consider it a subgeneric group.

Bartsch subdivided *Arca gradata* Broderip and Sowerby, *auctorum,* into the typical form (from Mazatlan), *Acar bailyi,* new species (from Balboa, Orange County, California), and *Acar panamensis,* new species (from Panama,

[1] Proc. U. S. Nat. Mus., Vol. 80, Article 9, pp. 1-4, pl. 1, 1931.

the Galapagos Islands, and Mantua, Ecuador). The Southern California shell named *A. bailyi* is quite small and appears to be specifically distinct from *gradata* but *A. panamensis* may be only a more coarsely sculptured variety of the Mazatlan species. In all probability *A. panamensis* is the same as *"Byssoarca" pusilla* Sowerby (Proc. Zool. Soc. London, Part 1, pp. 18-19, 1833), for there seems to be nothing in Sowerby's original description by which to separate it from Bartsch's species, and Carpenter (Cat. Reigen Coll. Mazatlan Moll., p. 142, 1855-57) suggested *pusilla* was very close to *A. gradata*. Furthermore, Carpenter (*id.*, p. 142) stated in his discussion of *gradata* that it varied "considerably in the fineness or coarseness of the cancellated markings" as well as in several other characters, so that it is improbable there are more than two distinct forms of such a variable species worthy of separate names.

The clearing up of old specific confusions is of much value but there are still many old and partially overlooked specific names that need investigation. It is hoped that some conchologist who has a sufficiently large series of shells available will make a careful comparison of the Caribbean *Barbatia domingensis* (Lamarck) which Dall called, apparently erroneously, *Barbatia reticulata*, with the Pacific *Barbatia gradata* and its allies. It is possible that the form called *pusilla* may be identical with the Caribbean Miocene to Recent *B. domingensis* (Lamarck).

TWO NEW POLYGYRAS FROM NORTHERN ARKANSAS

BY HARALD REHDER

Mr. Ernest J. Palmer of the Arnold Arboretum, during a botanical expedition, collected at Calico Rock, in northern Arkansas, two forms of *Polygyra* which are apparently new. Calico Rock, a typical river bottom town, in Izard County, is situated on the White River, which meanders through a rather narrow valley. The snails were found along the dol-

omitic bluffs which contain the valley and which are topped in places by a sandstone cap.

POLYGYRA CLENCHI, new species. Pl. 10, figs. 1-3.

Shell rather solid, depressed, upper surface rather flattened; openly umbilicate, the diameter of the umbilicus one-tenth that of a shell. Whorls about five, flattened on top; last whorl rounded at the periphery. The color is dark straw with a dull luster. The sculpture consists of rather low irregular striations (not as regular as in *P. indianorum* Pils.) and minute, irregular, impressed, spiral lines; nuclear whorls smooth. Aperture subcircular, slightly oblique. Peristome white, thickened, the upper part hardly expanded, the lower part expanded but not reflected. A very thin glaze joins the ends of the peristome.

	Maj. diam.	Min. diam.	Alt.	Whorls
Type	20.9	17.5	10.0	5
Paratype	22.2	18.5	10.5	5
Paratype	21.2	17.9	9.5	5
Paratype	19.8	16.8	9.0	4¾

Holotype: M. C. Z. No. 81347, from the foot of dolomitic bluffs of White River at Calico Rock, Izard County, Arkansas. Collected by Ernest J. Palmer. *Paratypes:* M. C. Z. No. 81348, and Coll. H. Rehder.

This species is close to *P. indianorum* Pils. in general shape, and in the minute spiral lines, but differs in being less regularly and distinctly finely striate, and in being widely umbilicate. It seems to lack the gloss seen in *indianorum*. It also differs in having the upper part of the lip not expanded, being in this respect like *P. roemeri* Pfr. The rest of the lip is however more expanded than in *roemeri*, but not as much as in *indianorum*, where the lip is subreflected. This gives the lip a rather broader appearance than the lip of *roemeri* and *indianorum*.

This species is a member of the Ozarkian fauna, and apparently a close relative of *P. indianorum*, which has been found thus far only south of the Arkansas river.

POLYGYRA PEREGRINA, new species. Fig. 1.

Shell in form and sculpture like *P. troostiana* Lea, but tending to average slightly larger; whorls about 6 to 6¼, about a half a whorl more than in specimens of *troostiana* of the same size. Color generally pale corneous, somewhat glossy. Umbilicus smaller than in *troostiana*. The important difference, however, is in the teeth. The parietal tooth is more pointed and prominent; the basal tooth is further out

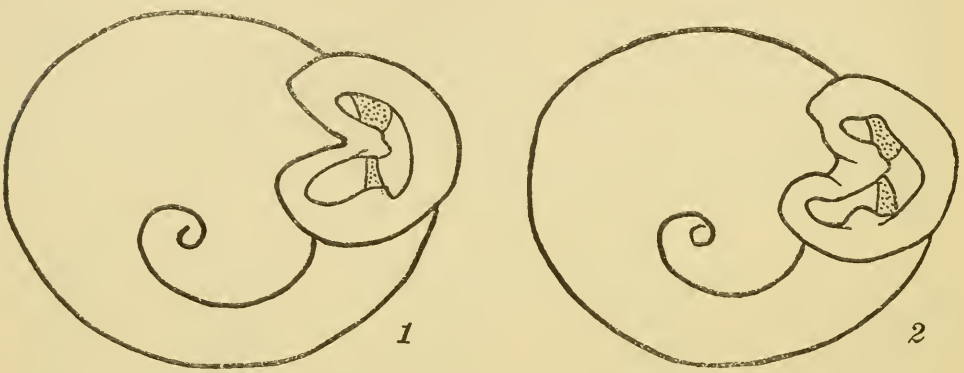

Fig. 1. *Polygyra peregrina* Rehder. Fig. 2. *Polygyra troostiana* Lea.

on the lip, not as deep as in *troostiana,* and is longer and not as conical; the superior palatal tooth is deeper and broader. These differences in the teeth are the important characters, and may easily be seen in figures.

	Maj. diam.	Min. diam.	Alt.	Whorls
Holotype	8	6.9	3.5	6
Paratype	8.2	7.1	3.1	6
Paratype	8.4	7.3	3.8	6¼

Holotype: M. C. Z. No. 81349, from the foot of dolomitic bluffs of White River at Calico Rock, Izard County, Arkansas. Collected by Ernest J. Palmer. *Paratypes:* M. C. Z. No. 81350, Acad. Nat. Sci. Phila. No. 157620, and Coll. H. Rehder, from same locality.

As may be gathered from the description, this species is closely allied to *Polygyra troostiana,* differing however distinctly and constantly in the nature of the teeth. Its habitat

is 350 miles west of the region where *troostiana* is found, across the Mississippi River, and is apparently a member of the Cumberlandian fauna as defined by Pilsbry (Mollusca of the Ozarkian Region, Proc. Acad. Nat. Sci. Phila., p. 531 [1906]).

It is quite unusual to find two new forms of *Polygyra* in one locality in the Middle West, but I am certain even more will be uncovered when the Ozarkian region is thoroughly explored, especially northern Arkansas.

LYMNAEA (FOSSARIA) PERPLEXA IN SOUTHERN CALIFORNIA

BY WENDELL O. GREGG

A small fresh-water gastropod which has been puzzling me for the past ten years has proven to be *L.* (*Fossaria*) *perplexa* F. C. Baker and Junius Henderson.[1] This well-named species first came to my attention in 1922, at which time specimens were incorrectly identified by H. Hannibal as *L. truncatula*. The specimens were found in Hallenbeck Park, Los Angeles, around the base of a leaking hydrant. The following year specimens were taken in a small lake in Elysian Park and also clinging to moist flowerpots in a greenhouse in Lincoln Park, Los Angeles. Most of these specimens were quite immature. In 1924 two specimens were taken in the Rio Hondo near Montabello and again in 1928 about three dozen specimens were taken in a small creek north of the Los Angeles River and opposite Griffith Park. On June 8, 1930, a small colony was found along the creek in Big Tujunga Canyon, about one mile below the dam. Later that year specimens were found in a small brook near Ave. 64, in La Loma Lake, brook connecting La Loma Lake with the Arroya Seco, and Arroya Seco Creek, below La Loma Drive, all four localities in Pasadena. Specimens taken at 6,400 ft.

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[1] Nautilus, XLII, 103-104, 1929.

elevation at Bear Flats Meadows, near Mt. San Antonio, San Gabriel Mts. are also probably referable to this species.

The shells from Big Tujunga Canyon and from near Griffith Park were examined by F. C. Baker and definitely identified as *perplexa*. I have carefully examined topotypes of that species kindly furnished by Junius Henderson and have compared them with all of the above mentioned specimens.

The above records of material taken in varied localities in Los Angeles County and collected over a period of eight years show quite conclusively that this form is a well established member of our fauna and not a species accidentally introduced. It seems strange that a form so widely distributed over Los Angeles County should have escaped notice all these years in a community where there were so many conchologists. However it has never been found in abundance; frequently several trips to the same locality have yielded only a small set. Mony of the specimens found have been "too young for identification," at least until one has been sufficiently patient to procure and study a complete series ranging from very small to fully adult shells. Because of its small size it is probable that many a shell collector has passed it by thinking it the young of one of our well known forms.

It was stated by Junius Henderson in 1929[2] that *perplexa* was known only from Grand Coulee, Wash., the type locality, nearly a thousand miles north of Los Angeles County. Hannibal[3] reported *Lymnaea truncatula* from southern California giving quite a number of localities. It is known, however, that *truncatul*a does not occur in this region. Since the specimens from Hallenbeck Park which he identified for me as *truncatula* have turned out to be *perplexa*, it is reasonable to believe that many of his records of *truncatula* in southern California are also referable to that species.

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[2] University of Colorado Studies, XVII, No. 2, p. 134.
[3] Bulletin, Southern California Acad. Sci., XI, No. 1, pp. 25, 26.

CARINIFEX JACKSONENSIS, NEW SPECIES, FROM WYOMING

BY JUNIUS HENDERSON

Jackson Lake, Wyoming, south of Yellowstone Park, is the type locality of *Lymnaea* (*Stagnicola*) *jacksonensis* Baker, and *Pomatiopsis robusta* Walker. The depth and area of the lake has been greatly increased by the construction of a long, high dam, thus changing shore conditions. I have visited it several times at high water stage and failed to find any mollusks. Last August Mrs. Henderson and I stopped there in passing and found the water level very low, due to withdrawal of water for irrigation during the hot, dry season. Just back of the dam, on coarse gravel bottom, in water only two or three inches deep, we found live mollusks in abundance including a new species of *Carinifex*. Specimens were submitted to Dr. G. Dallas Hanna, who is very familiar with the species of this genus, both living and fossil, and he agrees that it is undescribed. Soon after returning to Boulder I received from Dr. S. S. Berry dead shells of the same species obtained in South Fork of Snake River, just below the lake, perhaps washed out from the lake.

CARINIFEX JACKONENSIS, n. sp. Pl. 11, fig. 6.

Shell compact, closely coiled, similar in general form to *C. newberryi* (Lea), but much smaller, the largest live mature shell but 11.5 mm. in major diameter, one dead shell (a cotype) measuring 13.5 mm. in diameter and 11 mm. in altitude. It varies greatly in elevation of spire, consequently in proportion of width to height. The umbilicus is usually proportionately about as in *newberryi,* but in very flat specimens it is quite wide. Whorls 4, slowly and regularly increasing in size, somewhat convex above and below the shoulder. Shoulder strongly angled well above the middle of the whorl, in flat specimens about level with the apex. A very slight depression just back of the shoulder above and another just below the shoulder, causes it to stand out as a low ridge, a feature more or less developed also in other species of the genus. The open umbilicus is defined by a similar ridge,

spirally ascending the opening. Suture slightly channeled. On some specimens very fine, irregular, obscure, spiral striae are visible, especially toward the umbilicus, and several rather obscure spiral ribs often occur between the shoulder and the umbilicus. The shell is covered throughout with fine, fairly regular axial striae, which become coarser on the last whorl, giving the whole shell, under a lens, a peculiar roughened appearance, not noticeably smoother below the shoulder.

A NEW HELMINTHOGLYPTA FROM MONTEREY COUNTY, CALIFORNIA

BY G. WILLETT

On July 5, 1930, the writer, accompanied by his wife and a party of friends, visited a fossil deposit of Miocene marine molluscs situated in Lowe Canyon, southern Monterey County, California. This locality lies between Ranchita and Vineyard canyons, on the westerly slope of the Diablo Range, about one mile east of the Vineyard Canyon road, which runs from San Miguel to Parkfield. Owing to prevailing excessive heat, only a short time was spent in examining the interesting deposits of fossil pectens and oysters, but during this time two helicoid fragments were found, which, though very imperfect, did not seem to belong to any species known to the writer.

On March 31, 1931, we again had the opportunity to visit Lowe Canyon, and a two hours' search among the ledges of fossiliferous rocks produced about a dozen specimens, mostly dead and in poor condition, but including three or four that were good enough for comparative study. As had been suspected, these proved to belong to an apparently undescribed species. This may be known as:

HELMINTHOGLYPTA REEDIANA, new species. Pl. 11, figs. 8, 9, 10.

Description: Shell rather small for the genus, moderately elevated; aperture almost circular, oblique; inner lip barely

reflected and encroaching slightly on the umbilicus; epidermis horn-colored; last whorl encircled by a reddish-brown band about one-half millimeter in width. Entire upper surface of type covered with irregular diagonal rows of fine papillae, these papillae merging on the the last whorl to form broken, raised lines, which extend over the base almost to the umbilicus. The extent and prominence of this papillation vary somewhat individually; in some specimens it extends onto the base, as in the type, and in others it ceases abruptly at the suture of the body-whorl. Last whorl marked by faint, incised, closely-spaced spiral striations, which are apparent on some parts of the surface and absent on others.

Type No. 1030, collection Los Angeles Museum; collected by G. Willett, in Lowe Canyon, Monterey County, California, March 31, 1931. Paratypes in collection of the writer.

Measurements of type in millimeters: Max. diam., 17.1; min. diam., 14.8; alt., 10.5; umbilicus, 2.8; number of whorls, 6.

Named for Mr. Fred M. Reed, of Riverside, California, well known shell collector.

Remarks: In general appearance *H. reediana* resembles *H. traski carpenteri* Newc., which occurs on the eastern side of the same range of mountains, but it differs from that species in slightly larger umbilicus and wide-spread papillation. Should specimens be found in the territory intervening between the known ranges of the two forms, they may prove to be but subspecifically distinct, but in the absence of such material, it is probably best to regard them as different species.

The writer is indebted to Mr. and Mrs. Robert Work, of Ranchita, who originally guided him to the Lowe Canyon locality, as well as to the California Academy of Sciences, through Dr. G. Dallas Hanna, who furnished for comparative purposes a series of *H. t. carpenteri*, a species poorly represented in our collection.

Los Angeles Museum, Los Angeles, California.

NOTES AND NEWS

GUSTAVE F. DOLLFUS.—We have heard with great regret of the death on November 6, 1931, of this eminent worker on mollusks, recent and fossil, at the age of 81 years.

VIVIPARUS JAPONICUS v. Mart.—Another New England record for this species was obtained in a small ice pond one-half mile east of Houghton's Pond, Blue Hills Reservation, Mass. Specimens were collected in the fall of 1930 and again in 1931. Young were fairly abundant, and from all indications the species has become well established. The presence of goldfish would indicate as well that the form was introduced at the time the fish were planted.—W. J. CLENCH.

If POLYGYRA POLITA P. and H. (NAUTILUS 21:38) is considered a homonym of *"H. tridentata polita"* Wetherby (Naut. 8:44), it shall be called *Polygyra perpolita*. The offhand way this name of Wetherby's was proposed, by a man who did not believe in subspecific names, leaves some doubt as to its validity.—H. A. PILSBRY.

BURNUPIA CAPENSIS STRIATISSIMA, n. subsp.—The shell is brown, higher than *B. capensis* Wkr., with very close, strong radial striation, stronger than in any described African species. Apex strongly recurved, close to or overhanging the right side.

Length 8.2 mm., width 5.3 mm., alt. 4 mm.

Length 7.3 mm., width 4.5 mm., alt. 3.4 mm.

Quthing, South Basutoland, South Africa, collected by Dr. F. G. Cawston.—PILSBRY.

COLLECTING IN TENNESSEE.—Vander Schalie and I overhauled some of the southern streams during a three weeks' trip, revisiting the place where Rhoads collected in the Harpeth, doing the Duck River in four places, the Buffalo in five, the Elk in two and what remains of the original Muscle Shoals. Many of the southern streams are silted up with field wash. The Tombigbee, for example, is a mud hole now. The Buffalo, after the floods went down, was sweet, clean and a

delight for collecting. We did well in the Tennessee and the Elk by feeling, but it was tough work. Conrad's collecting place in the Black Warrior was visited. Scarcely a sign is left of the stage road he used, and to get to his crossing we had to follow dim paths bordered by high weeds wet with dew, which was equivalent to falling into the river.—CALVIN GOODRICH.

YOU MAY BE INTERESTED TO KNOW that we had a very successful time in southern Illinois, combing the Ozark range from the Ohio to the Mississippi River, and collecting from base to top of the higher hills. Apparently there are some forms which are like the southern Indiana and western Kentucky species. The collection is especially rich in Polygyra, which fairly abounds in these limestone hills. As far as possible I shall work up the collections this winter so that gaps may be filled in next summer.—FRANK C. BAKER.

THE KURO SHIO AND THE AMERICAN COAST.—I have lately come upon some further information upon the Japanese current. I was told by different persons that this last spring glass fish net floats were common on the beach, some with Japanese lettering or words blown in the glass; also bamboo was common, some pieces several inches in diameter. One piece was found with a spear point lashed on the end with something like rattan used in wrapping.—J. E. MALONE, Portland, Ore.

TWO IMPORTANT WEST COAST SHELL COLLECTIONS have recently changed hands. That of the late C. E. White, numbering some 6,500 species of marine shells, and of Miss Jeanett Cooke, comprising some 2,500 species of land, freshwater and marines, many of which were collected by Captain Porter in the Gulf of California. Mr. Herbert N. Lowe of Long Beach, Calif., has acquired both of these collections, and is incorporating them with his already extensive collection. They are being cataloged with the able assistance of Mr. E. E. Hand of Chicago, who is now making his home in Long Beach.

LAKE MERRITT MOLLUSKS.—During a recent visit to Oakland I had opportunity to observe the molluscan fauna of Lake Merritt. Originally a fresh-water lake, it is now connected by a dredged channel with San Francisco Bay, and a set of flood gates maintain the water at high tide level. These artificial conditions make it difficult both for the molluscs to establish themselves, and for the collector to obtain the molluscs. In several hours walking along the shore, I found but four species, as follows:

Modiolus plicatulus Lamarck.

Petricola pholadiformis Lamarck.

Mya arenaria Linné.

Nassarius obsoletus Say.

It is interesting to note that none of these species is native to the Pacific coast, but all are Atlantic forms that have probably been introduced into San Francisco Bay with seed oysters.

Dr. S. S. Berry informs me that he believes that this is the first record of *Petricola pholadiformis* from this coast.—JOSHUA L. BAILY, JR., San Diego, Calif.

SOME LAND SHELLS FROM GRANDFATHER MT., N. C.—This list of mollusks from Grandfather Mt., although undoubtedly incomplete, seems worthy of note, as three of the species found here have not been reported from Roan Mt., which is only about 20 miles west of Grandfather Mt. The shells were collected by the author during a hurried stop on the south side of the mountain in September, 1930.

Polygyra altispira Pils. Fairly common.

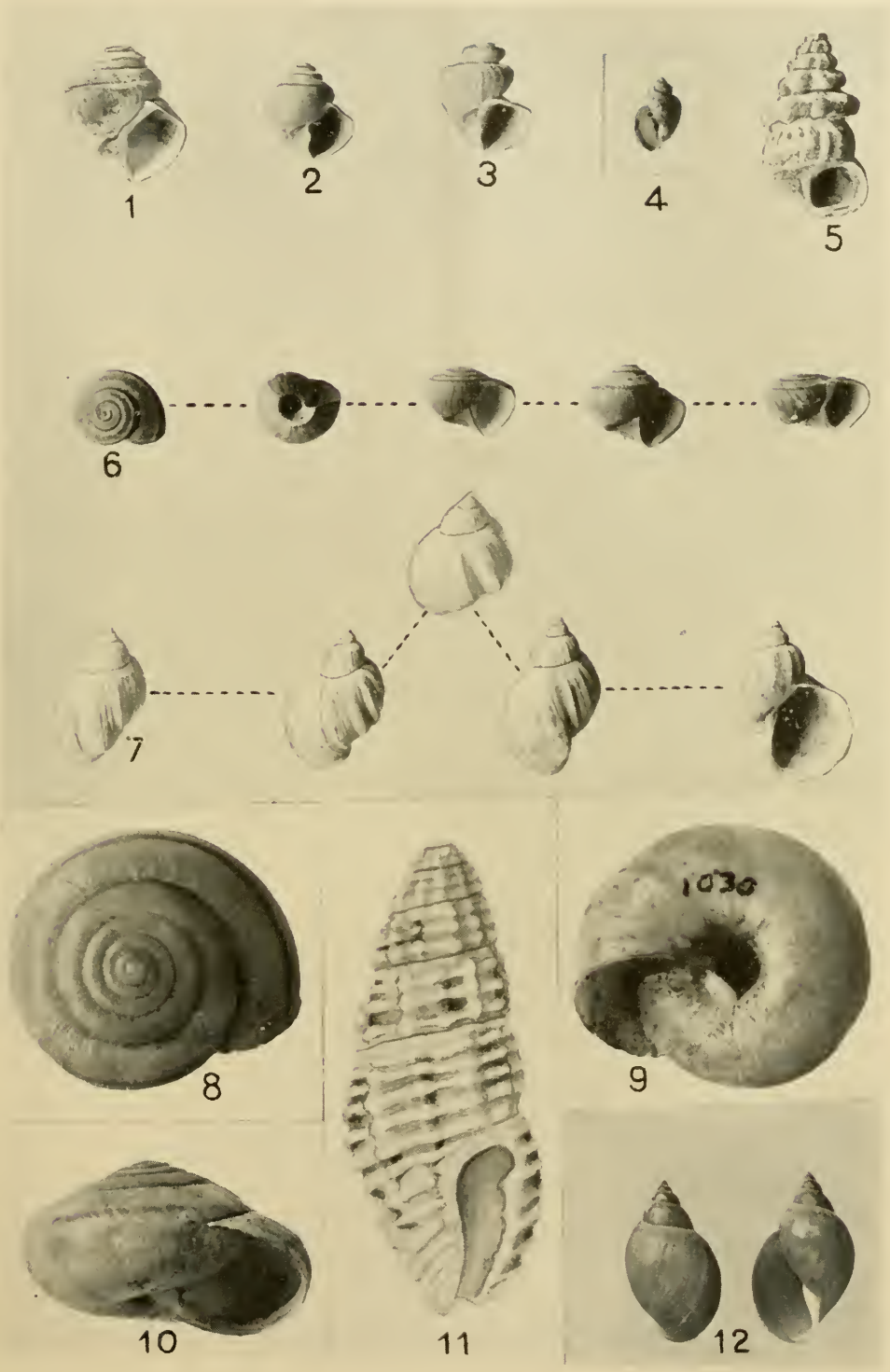
Polygyra tridentata Say. Very common. All of the specimens are smaller than the usual, one full grown specimen having a major diameter of only 11.5 mm.

Polygyra wheatleyi Bld. Rare, thin and toothless.

Mesomphix rugeli W. G. B. One young specimen.

Vitrinizonites latissimus Lewis. Fairly common.

Vitrinizonites latissimus uvidermis Pils. Rare. Neither *latissimus* nor *uvidermis* have ever been taken as far north as this locality, while the latter has been considered peculiar



1—3. Carinifex newberryi. 4. Scalariform Physa. 5. Distorted Cerithidea californica. 6. Carinifex jacksonensis. 7. Lymnaea utahensis. 8, 9, 10. Helminthoglypta reediana. 11. Mangelia fredbakeri. 12. Physa h. interioris.

to the Great Smoky Mountain region. The one specimen of *uvidermis* found was quite typical.

Ventridens gularis decussata P. & V. Rare. This subspecies has not been reported from Roan Mt.

Anguispira alternata Say. Rare.

Haplotrema concavum Say. Fairly common.

—Gilbert S. Banks.

Physa humerosa interioris Ferriss, 1920 (Nautilus 34:2, 4, 7), is, in my opinion, a form of *Physa virgata* Gld. As the name is in print, I am figuring, Pl. 11, fig. 12, the face of the type and back of a paratype, No. 45871 ANSP., from the west branch of Navajo Creek, Coconino Co., Arizona. Length 12.7 mm. Color a brownish cinnamon-buff. *Physa traskii* Lea and *P. orbignyana* Lea are, in my opinion, also forms of *P. virgata;* the former is larger than *interioris* but otherwise very similar.—Pilsbry.

Carinifex newberryi subrotunda, n. subsp.—The cinnamon brown shell has a low convex spire of 4½ whorls, separated by a conspicuously channelled suture, a narrowly rounded ridge near it. On the last whorl the keel near periphery becomes low and weakly indicated, the periphery rounded. Height 9 mm., diam. 13 mm. Head of Fall River, Siskiyou Co., California. Type 73494 ANSP., paratypes in California Acad. Sciences. Specimens were distributed under this name in 1924, and an abridged definition is now published in advance of an illustrated account.—Pilsbry.

Stagnicola apicina and Stagnicola walkeriana.—The receipt of Mr. Goodrich's excellent paper on the "Mollusks of Keweenaw County, Michigan," brings to my attention the fact that a change made several years ago for a common species has been overlooked. In the "Revised Check-list of Michigan Mollusca" the same reference occurs. In these papers the authors followed my disposition of the species as set forth in the "Lymnaeidae of North and Middle America," where this species is referred to *Stagnicola apicina* Lea, the type locality being the Willamette River, Oregon. When preparing the volume on the "Fresh-water Mollusca of Wiscon-

sin" the incongruity of the reference of the Michigan species to this western species was recognized and in THE NAUTILUS, 39:119, 1926, the Michigan and Wisconsin species was given a new name, *Stagnicola walkeriana* Baker. In the "Freshwater Mollusca of Wisconsin," Vol. I, p. 247, the species was again described and figured and reasons for its separation from *apicina* given. *S. walkeriana* is a very abundant species in Lakes Superior and Michigan and in many of the tributary rivers of these lakes—FRANK C. BAKER.

PROLONGED AESTIVATION OF LYMNAEIDS.—It has long been known that some Lymnaeidae, such as *caperata, obrussa, bulimoides, hendersoni,* etc., have developed an adaptation to life in pools and ponds which are dry during a great deal of the time. The mollusks live in a dormant state in the moist mud beneath the dry surface of the pool bed during droughts, and promptly become active when the basin fills with water. An unusually prolonged occurrence of this sort was brought to my attention by some specimens of *L.* (*Stagnicola*) *bulimoides cockerelli* Pils. and Ferr., received January 5 from Professor R. J. Gilmore, of Colorado College, Colorado Springs, Colorado. He found them alive in a few pounds of soil from the bottom of a pool at that city. The pool seldom contains water for more than 60 days in a year, and during 1931 was occupied by water for less than 30 days, yet the snails are normal and the adults are of full size.—JUNIUS HENDERSON, University of Colorado.

COMMENTS ON WESTERN LYMNAEIDAE.—In 1930 Mrs. Henderson and I stopped for a few moments at a slough about three miles west of Montpelier, Idaho, and obtained eight live specimens of *Lymnaea stagnalis wasatchensis* Hemphill, mostly immature though large. Three adults each measured over 60 mm. in length. The largest recorded measurement of an American Lymnaeid of which I have a note is 57.5 mm., *L. s. jugularis* (*appressa*), Baker's Lymnaeidae of North America. The measurements given in the original description of *wasatchensis* run from 32.5 to 45 mm. In 1931 we again visited the slough and found it "bone

dry." Of course there were no live specimens, but dead shells were abundant, all adults well above 50 mm. in length, but none up to 60 mm.

Specimens of *Lymnaea* (*Radix*) *auricularia* Linn., from Aptos, California, sent in to the University of Colorado Museum by Mrs. Paul E. Richter, add another to the American localities for this European species.—JUNIUS HENDERSON.

POLYGYRA KIOWAENSIS.—In the Third Supplement to the Fifth volume of the Terrestrial Air-Breathing Mollusks, etc. (Bull. Mus. Comp. Zool. Harvard, 19, No. 4 [1890]) on page 199 W. G. Binney gives the original description, copied from the Proceedings of the U. S. National Museum, p. 449, (1888), of *Polygyra kiowaensis* Simpson, and a figure. The specimen from which the figure was drawn, and labeled as such, is in the W. G. Binney Collection, a part of which is now in the Museum of Comparative Zoology. Binney says that he received the shell from Simpson himself, but it is readily seen that it is not *P. kiowaensis* at all, as a glance at the figure alone will show. The specimen was compared with a cotype of *P. kiowaensis* in the M. C. Z. collection. Unfortunately there is no locality with the specimen, which makes its specific determination difficult, but it is, without doubt, a species of *Ashmunella* belonging to the *chiricahuana* group, and very close to that species.—HARALD REHDER.

PUBLICATIONS RECEIVED

SOME FACTORS AFFECTING THE REPLACEMENT OF THE COMMERCIAL FRESH-WATER MUSSEL. By M. M. Ellis. Bureau of Fisheries, Fishery Circular No. 7. Extensive field observations show that "extensive and rapid reduction, amounting in many places almost to extermination of the mussel fauna, is to be expected if the erosion and pollution problems are not solved, in view of various improvements for navigation now existing or already authorized throughout the Mississ-

ippi, Ohio and Tennessee drainages." This pamphlet is for sale by the Superintendent of Documents, Washington, D. C., price 5 cents.

MOLLUSCAN PROVINCES IN THE WESTERN UNITED STATES. Univ. Colo. Studies, v. 18, No. 4, 1931. By Junius Henderson. The subject outlined four years ago in NAUTILUS 41:85, is here taken up in detail, with a map showing Prof. Henderson's conclusions.

ENTOVALVA (DEVONIA) PERRIERI (MALARD) IN THE WESTERN ATLANTIC. By W. J. Clench and C. G. Aguayo. Occ. Pap. Boston Soc. N. H., vol. 8, pp. 5-8, 1931. This remarkable little bivalve was found at Woods Hole and North Falmouth, Mass., on the holothurian *Leptosynapta*.

THE WEST AMERICAN MOLLUSKS OF THE GENUS ACAR. By Paul Bartsch. Proc. U. S. N. Mus., vol. 80, Art. 9, 1931. *Acar* Gray, usually considered a section of *Barbatia*, is given generic rank. The small form common in southern California is described as *A. bailyi*,—certainly a well marked species. *A. gradata* B. & S. is the form of the Mazatlanic area, and *A. panamensis*, n. sp., that of Panama. The latter seems rather hard to separate from *gradata*. All are figured. —H. A. P.

THE PARYPHANTIDAE OF NEW ZEALAND: THEIR HYPOTHETICAL ANCESTRY, WITH DESCRIPTIONS OF NEW SPECIES AND A NEW GENUS. By A. W. B. Powell, 1930. Records of the Auckland Institute and Museum, Vol. 1, No. 1, pp. 17-56, 7 pls. An exceedingly interesting and valuable paper dealing with the taxonomy, distribution and relationships of this group in New Zealand. A genus, *Wainuia*, genotype, *Helix ursula* Pfr., six species of *Paryphanta*, with two subspecies, one species of *Schizoglossa* and three species of *Rhytida* are described as new. The family name of Rhytididae is changed to Paryphantidae in accordance with the generally accepted

rule[1] that the family name is to be based on the oldest genus name included in the family.—W. J. CLENCH.

DESCRIPTIONS OF NEW MARINE MOLLUSKS FROM PANAMA, with a figure of the genotype of Engina. By Paul Bartsch. Proc. U. S. N. M. 79, Art. 15, 1931. *Anachis tabogaensis, Anachis dalli, Eudaphne* (n. gen.) *allemani, Mitra marshalli, Rissoina allemani, Engina panamensis* and *E. tabogaensis* are fully described and beautifully figured. Dr. Bartsch's descriptive work is so thorough that we hesitate to mention a serious omission,—the entire absence of comparisons with known species of the region. Thus, a few words explaining how *Anachis tobagoensis* differs from *A. lentiginosa* Hinds (plus *C. guatemalensis* Rve. and *C. tessellata* C. B. Ad.) would be most helpful. Also a comparison of *Anachis dalli* and *A. nigricans* (Sowb.), *Engina panamensis* and *E. carbonaria* (Sowb.), *Eudaphne* and *Daphnella* Hinds, and so on. It may be supposed that differences exist, and no doubt the points of distinction are obvious to Dr. Bartsch, but it would do no harm to point them out to those who have not made a deep study of the species, yet who may have occasion to identify specimens. Of course, if all previously known shells were described with the full details given by Dr. Bartsch the differential features could be reached by a laborious comparison of descriptions, but actually we have the brief descriptions of Sowerby and Reeve to deal with. A new species, like any isolated fact, has very little value until brought into some relation with existing knowledge.—H. A. P.

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[1] There is no such rule; custom has been on the side of accepting family names on the basis of their priority, like all other systematic names, but there have been many exceptions. The varying contents of families due to shifting of genera makes the names based on the oldest genus rather unstable. People who love change are using the oldest genus fad as a pretext to indulge their passion for changing the names of long recognized families.—ED.

THE WASHINGTON MEETING OF THE AMERICAN MALACOLOGICAL UNION

The second Annual Meeting of the Union will be held in Washington, May 26 to 28.

The headquarters will be at the Harrington Hotel, 11th and E Streets, Northwest, only a couple of squares from the National Museum. The rates are: Single rooms with bath, $2.50 and up; double rooms with bath, $3.50 and up. It is probable that the annual dinner likewise will be held at this hotel.

Members having papers to read are asked to send titles to the Secretary or to Dr. Paul Bartsch, so that a program can be prepared.

Let us make the Washington meeting an excellent one, even better than the one held in Philadelphia—if that is posible. No member of the American Malacological Union should miss the opportunity to combine in one excursion patriotism, science and pleasure. Remember the historic places close at hand—Mt. Vernon, White House, Woodlawn, Wakefield, Christ Church, Old Pohick Church, Great Falls. General Washington knew them all—played, worked, worshipped in them.

Science and art are here in the Smithsonian Institution, the National Museum, the Freer Gallery, the Corcoran Gallery, the Bureau of Fisheries, the Army Medical Museum, the National Zoological Park and many other institutions.

Tentative plans include a motor trip to Plum Point on the Chesapeake Bay, the locality which yielded the first American fossils. Also a visit to the Biologists' Field Club on Plummer Island, in the Potomac above Washington.

Our advice is: attend the meeting and bring the members of your family so that they, too, may enjoy and profit by a visit to Washington during its bicentennial celebration of the birth of George Washington.

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